

JIM AND PEGGY AT APPLE-TOP FARM



WALTER COLLINS O'KANE

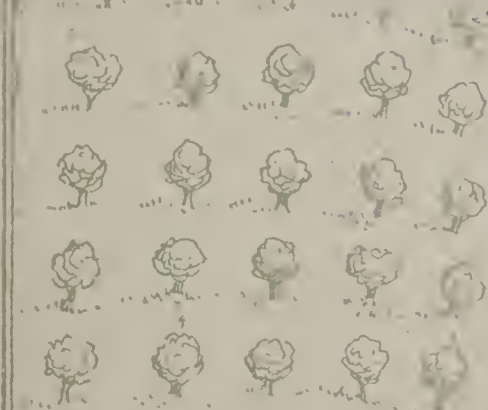


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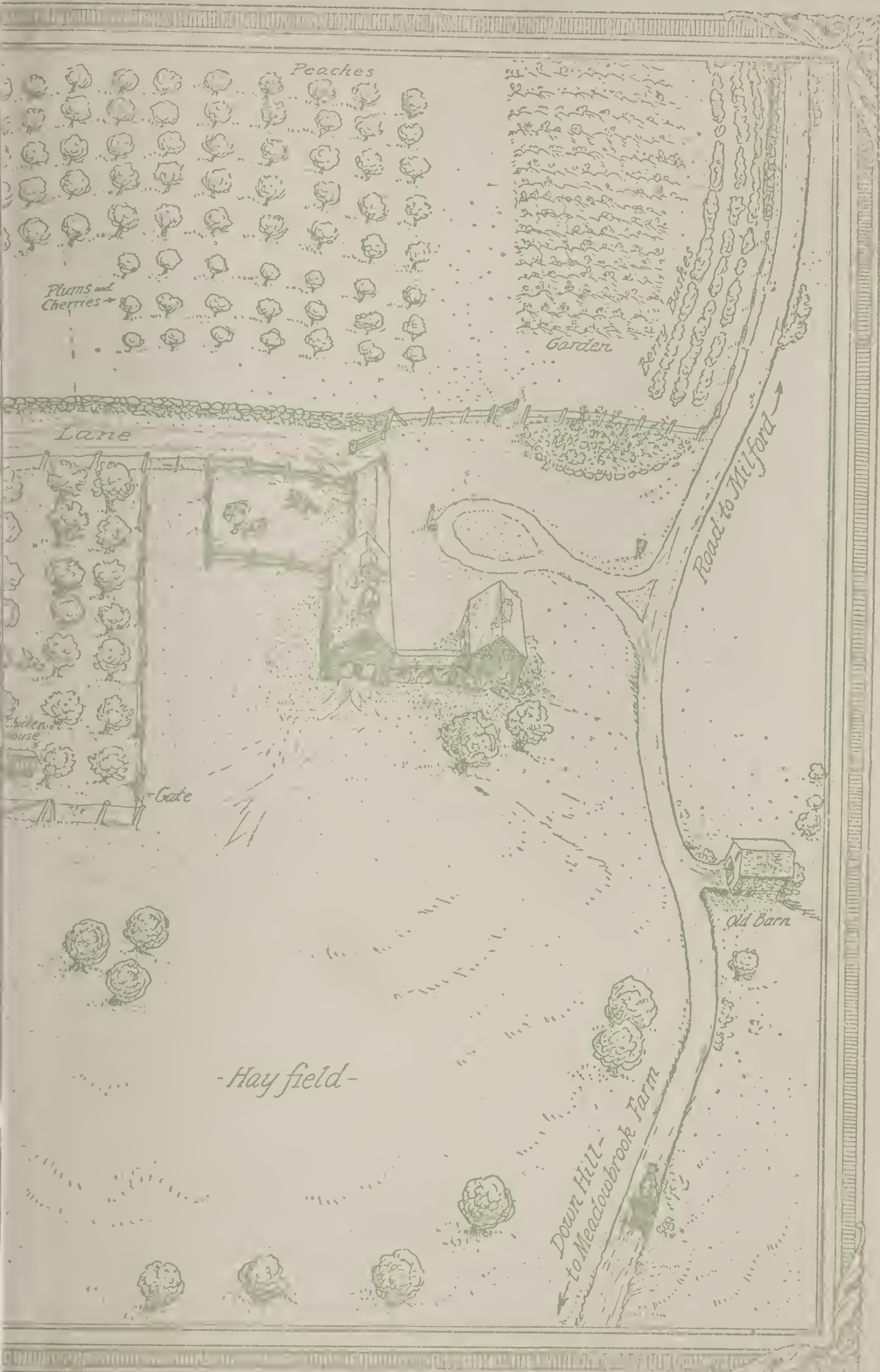
Spring

Bridge

Rocks

Blue berry Bushes

Map of
**APPLETOP
FARM**



Peaches

Plums and
Cherries

Garden

Lane

Road to Milford

House

Gate

Old Barn

- Hay field -

Down Hill -
to Meadowbrook Farm

JIM AND PEGGY
AT APPLE-TOP FARM

BY WALTER COLLINS O'KANE

JIM AND PEGGY AT MEADOWBROOK FARM
JIM AND PEGGY AT APPLE-TOP FARM



The Apple Trees Were White with Bloom

Jim and Peggy at Apple-top Farm

BY
WALTER COLLINS O'KANE
AUTHOR OF "JIM AND PEGGY AT
MEADOWBROOK FARM," ETC.

WITH MANY ILLUSTRATIONS FROM PHOTOGRAPHS
TAKEN BY THE AUTHOR



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JIM AND PEGGY AT APPLE-TOP FARM

CHAPTER I

APPLE-TOP FARM

UNCLE JOHN HARLOW got up from the breakfast table with an eager, fidgety look in his eye, and stood watching Aunt Emily, who was finishing the breakfast dishes.

"About ready, mother?" he asked.

She nodded. "It won't take me three minutes more," she said.

Uncle John walked to the door, opened it, and spied his son Jim racing after Peggy, who was just disappearing around a corner of the woodshed.

"Come on, Jim!" he called. "Let's hitch up!"

Jim and his sister Peggy hurried to the stable. They had been waiting impatiently for half an hour.

It was the day after their father and mother had come back from the place on the hill and had surprised them with the news that the farm up there was to be their new home. There had been no time the evening before to go and see the

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farm or even to ask many questions. It had been dark when Uncle John and Aunt Emily came back. And of course you can't really see much of a farm after dark; although Peggy had proposed that they drive up and look at the house, anyway.

They were going to leave the city. That much they had found out. And the house that they were to live in was the one that you pass at the top of the hill as you drive from Uncle David's place toward Milford. They had often seen the house, but they'd never especially noticed what it was like. And they'd never guessed that this was the place where their father had lived when *he* was a boy, before *his* father went to the city. Uncle John had told them that the evening before.

"Don't remember so much about it myself," he said. "My dad took us to town to live when I was only twelve years old."

"Are we honestly going to live there always?" Peggy demanded.

Uncle John looked at Aunt Emily in an inquiring way, and she looked at him with the same sort of question in her eyes.

"Well," he declared, "we're going, anyhow! Don't know yet about the 'always' part of it! Guess we'll have to see about that later."

And then he and Aunt Emily had insisted that Jim and Peggy go to bed, promising to take them to the new place the first thing in the morning.

Jim was reluctant to leave the others. So was Peggy. After they had gone upstairs they lay awake for a while, whispering loudly enough so that each could hear the other from their separate rooms. Downstairs there rose a steady hum of conversa-



The Farmhouse and the Old Barn

tion as their father and mother talked things over with Uncle David and Aunt Lucy.

Now it was morning and time for the promised visit.

As soon as Jim and his father harnessed Milly to the surrey Peggy and Aunt Emily climbed into the back seat and they started for the new farm. Across the familiar bridge, where the boards rattled

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under foot. Milly trotted, then slowly up the steep hill, with the harness creaking at each step.

Just at the crest, a half mile or so from Uncle David's Meadowbrook Farm, they drew into sight of a white farmhouse on the left side of the road, with a big, white-painted barn at the rear, connected with the house by a low building that looked like a woodshed. On the opposite side of the road, and somewhat nearer, there was another building, dull gray in color, as if it had not been painted for many years, as indeed it had not.

"That barn on the right isn't much to look at," said Uncle John, "but it may come in handy some day. I figure that it might make a good building for apple storage."

They turned in at a grassy driveway that led around the farther side of the white house. They stopped there and tied Milly to a tall wooden post. There was a hollow close to the post where other horses had stamped with their feet.

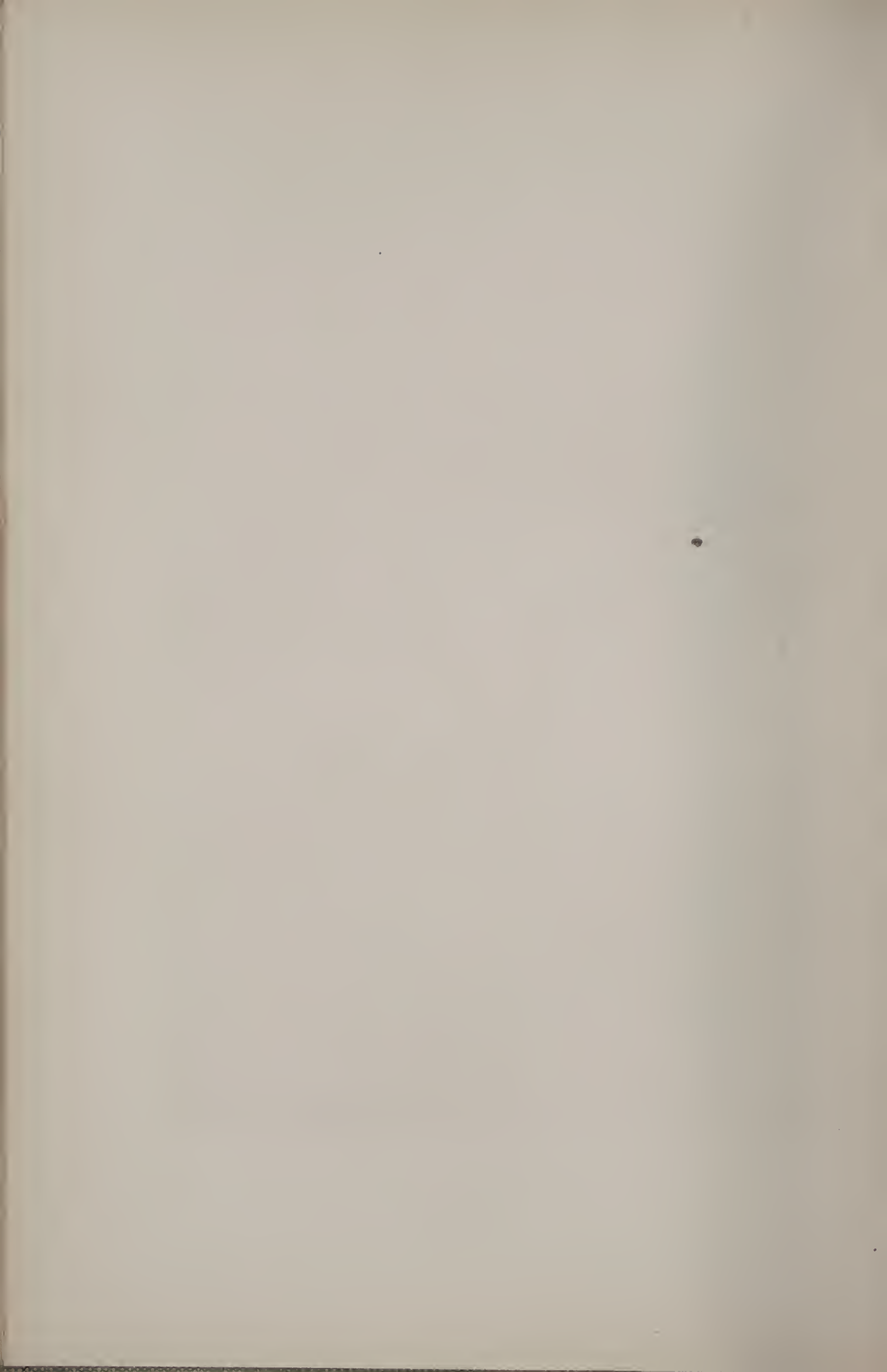
Jim jumped out to hitch Milly, and Peggy followed. But Aunt Emily and Uncle John sat in the surrey for a few minutes, looking all about them, at the house, the barn and the yard—just looking and saying never a word.

Peggy tried a door on the side piazza and found it locked.

"Did you bring the key, mamma?" she called. "Come on, let's go inside."



One of the Skyscraper Trees



“Why can’t we see the barn first?” Jim demanded.

But they all went into the house, and looked through it, from room to room, upstairs and down. In the sitting room there was a fireplace that must have been four feet wide. Built in at one side of it was a small, iron door that Aunt Emily said was the opening to the old brick oven. Uncle John swung the door open and they looked inside, but they couldn’t see anything except a dark, low space walled in and roofed over with bricks. The kitchen was much like that at Uncle David’s. The stairs to the second floor were steep, and squeaked as you went up.

“How old is the house, John?” asked Aunt Emily.

“I don’t know. You see it wasn’t in our family very long. My dad bought it after he was married. From the looks of it, though, I should think it was built more than a hundred years ago.”

They walked out into the summer kitchen. Jim had already gone on into the barn. He shouted from somewhere in that direction. “Come on out, dad,” he called, “there’s a cow barn, and horse stalls, and all kinds of things out here.”

So they all went into the barn by the roundabout way that led through the woodshed, and wandered here and there in the big, empty place. Jim and Peggy climbed up into the loft and found hay there that had been stored but never used.

On a wooden peg in a small room near the horse

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stalls an old set of harnesses was hanging. In another place there was a low wagon with iron wheels and on the wagon body was a barrel tank. Close to the tank was a pump with a long handle that stuck up into the air. The pump was connected to the barrel by an iron pipe. There was a coil of hose there, too, and a long rod made of bamboo, with a queer, round nozzle at one end.

"That's the spray rig that they spoke of," remarked Uncle John.

At one end of the barn there were big doors. They opened these and found themselves at the edge of a field. Fifteen or twenty old apple trees stood scattered here and there in it besides a row near a stone wall. Some of these trees were as tall as a house. In fact it would take a long ladder to reach to their upper limbs. Their trunks were big and the main limbs were long and heavy.

To the rear of the barn there was an orchard, with trees planted in regular rows, extending down a slope toward a grassy hollow. These trees were smaller than the big ones scattered over the field, but all of them were two or three times as tall as Uncle John. On the farther side of the hollow there was another orchard where the trees were quite small.

When they came back from the hollow they went through the barn, out of a small door at the other end, over a low, stone wall and into another block

of trees standing in straight, even rows. There were perhaps forty of these. A few, nearest the barn, had smooth bark and slender branches and glossy dark leaves. Uncle John said that they were sour cherry trees.

"I like sweet cherries," objected Peggy.



Jim and Peggy

"Yes, but the sour cherries are the kind to raise for market," Aunt Emily explained.

Close by there were a dozen or more small trees with low, rather flat tops. Some fruit from these was scattered here and there on the ground—small, dark-blue plums. The rest of the trees in this block were of medium size and were different from any

that they had seen so far. Their branches began only two feet or so from the ground, and their leaves were slender and pointed. It was easy to tell what they were, even if you didn't know beforehand from the appearance of the tree, for there was fruit on the branches - here and there—fuzzy, hard peaches, just beginning to show pinkish color.

Near a fence next to the road there were two or three long rows of blackberry and raspberry bushes. The ground between them and the peach trees was grown up to tall weeds. Uncle John said that it had been a garden.

They came back to the house then and sat on the side piazza, looking about at the yard and across a tree-filled valley to distant hills.

"What shall we call the place?" asked Aunt Emily.

They tried various names. But some of them didn't seem to fit and others were just like farm names that they had heard before.

"Well, it's apples, for one thing," said Uncle John. "That's the principal crop that the farm is going to raise. Apple—Apple—— What else?"

"It's a farm on a hill-top," mused Aunt Emily. "Hill—top——"

"I know!" said Peggy. "Let's call it Apple-top Farm!"

So Apple-top Farm it was.

CHAPTER II

PLANS

AFTER the farm had been given its new name Aunt Emily and Peggy went back into the house to look over the rooms once more, to plan where beds and chairs and tables should go, and to inspect the big kitchen again. But Jim and his father remained on the piazza, where they could look out toward the garden and the peach orchard and across the slopes toward the distant hills.

“Those old apple trees back there in the hayfield are regular skyscrapers, aren’t they?” remarked Uncle John. “Must be forty or fifty feet high! Well, that’ll be one of our jobs, Jim. We’ll tackle those trees a bit and see if we can’t get them down somewhere nearer the ground.”

“How can you do that”—asked Jim—“get them down nearer the ground?”

“Why, cut off some of the highest limbs and encourage the tree to send out new branches lower down. It wouldn’t do to cut the branches off all at once. But we can do it a little at a time. If you do that you can have a tree after a while that’s shapely and all right.”

Uncle John got up, found a stick lying near, took out his knife, and began to cut and shape one end of it, as if it were a branch of an apple tree that needed pruning.

"Probably we'll want to graft over some of the trees," he continued. "Most likely part of them are not the best varieties. It won't be hard to do that after we cut off the high limbs."

Jim wanted to find out how you graft trees, but his father went on talking and there wasn't any chance.

"Lots of the big old trees around this section are poor fruit that nobody would be willing to buy. But they can be grafted over, and in a few years they make profitable trees."

"Are we going to live here for a good many years?" asked Jim.

His father started to answer, but stopped and laughed in an uncertain way.

"That's another story," he declared. "Wait till your mother and Peggy come out again, and we'll talk about that."

"Come on," he invited, "let's go look at the old barn on the other side of the road."

They walked along the grassy driveway that curved past the piazza steps and out into the highway. As they turned into the road a black-and-white spotted dog came racing toward them. It was Tag, from Meadowbrook Farm. He had



There Was a Grindstone Near the Barn

missed them and had gone to find them, following the tracks of the horse and surrey along the road. When he joined them he barked and jumped about as if he had not seen them for weeks.

They found the old barn open; in fact the two big sliding doors that faced the road were out of order and couldn't be closed. Inside there were wisps of hay here and there on the floor, and overhead a great lot of cobwebs and a row of mud nests plastered against the rafters.

The broad space that you entered through the sliding doors ended in another pair of doors. These were on hinges and were shut. Uncle John unlatched them and swung them open. Outside there was an embankment that led down to the ground below. Because of the slope of the land the field at the back was much lower than the ground at the front.

Downstairs they found a big cellar with an earth floor. Tall posts supported the beams of the first story, above. Uncle John reached up as high as he could alongside one of the posts but could not quite touch its top.

"This is a good cellar," he remarked. "Some time, Jim, if we have good luck, we'll make an apple storage out of this. The stone walls are good, and you can drive right in at the rear there. Upstairs there's plenty of room to store empty barrels and fix up a place to pack boxes. 'Twouldn't cost

much to turn this into a pretty fair storage house."

Across the road from the old barn was the hay-field where the skyscraper apple trees stood. They climbed over the stone wall, walked across the field toward the grassy hollow at its rear margin, and stopped at the little run that wandered along in the hollow.

"Let's have a look at the spring," suggested Uncle John.

The water in the run came from a spot several yards beyond a low bridge. There were two or three boards level with the grass. Beneath these was a half barrel sunk in the ground. This was full of water, which poured in a tiny stream through a hole bored in the barrel near the top. For a space below the barrel the water was hidden by a mat of green plants. Uncle John said that these were watercress. "Probably we can sell some of this cress next year," he said.

He walked down the grassy run for a distance and called back to Jim to stand beside the barrel.

"It can be done all right," he said, when he came back.

"What done?" asked Jim.

"Get a water supply for the house. There seems to be fall enough to run a ram. You know what they are, Jim. One like your Uncle David's at Meadowbrook Farm. Of course it's a good ways up to the

house, but the flow is pretty strong and I know the spring never goes dry. Seems to me there was some talk about using this spring for a water supply when I used to live here, but it's too long ago for me



The Well Near the House

to remember much about it. That will be another thing that we can think of for some time in the future.”

“Can we water the garden with it?” asked Jim.

Uncle John shook his head. “That’s another

story," he said. He looked up the slope toward the house. "I don't know whether we'll need a water supply for the garden or not. If we do, though, a ram would hardly take care of it. Maybe we'll want to put in a gasoline engine, instead."

"There's a well up there by the house," suggested Jim.

"Yes, I know. But that well gets low in summer. There's hardly enough water in it to supply the stock. We used to drive them down here to the run to water them, sometimes. Besides, I'm not sure that the water in the well up there is really good to use in the house. It's pretty close to the barn, and it's just a dug well. Guess it's all right for some purposes, but I think we'll use this spring for drinking water."

Uncle John found a spot to his liking on the grassy slope above the spring and sat down. Jim followed. Overhead a big bird circled in broad sweeps—some sort of a hawk. But Uncle John's eyes and mind were on the young orchard that extended along the slopes across the hollow from the place where they sat.

"Those are good young trees," he speculated. "Said to be nine years old and ought to be coming into bearing. But they haven't been taken care of. In a few years they'll make a nice orchard. That block ought to be enlarged and take in the rest of the slope. There's room there for a hundred more

trees at least. And the blanks ought to be filled. You see, some of them have died."

To the left of the young orchard and farther down along the spring run there was an area of rough ground, covered with low bushes. Uncle John said that nearly all of that space was filled with



The Orchard with the Wire Fence Around It

blueberry bushes. They grew wild there. When he was a boy that was the place where they picked all their blueberries—many quarts of them. The patch ought to be all right still. That would be another place from which they could make sales of a crop that grew of its own accord—just like the water-cress.

There was still another crop like that on the farm. The rough pasture back of the old barn on the farther side of the highway was full of blackberry bushes.

On the slope above the spring was the orchard of medium-size trees that they had visited earlier. There was a wire fence all around this block, and an old chicken house at one side.

"We'll have our chickens in there, I suppose," said Uncle John. "That's what that orchard was fenced for. It isn't a very big range, though, and we couldn't have a large number in a space that size. That is, the young stock, I mean."

He looked across at the slopes opposite, where the young orchard had been planted.

"That's really the right place, over there," he said. "There is plenty of room, and it's far enough away from the garden so that the plants wouldn't be hurt by the chickens. The land slopes the right way, too."

He looked back again at the fenced-in space behind them.

"Of course it's farther to go over here to look after them. And there'd be the question of water. That would be all right if we put in a gasoline engine some time. We could run a pipe there easily enough."

He thought it over further.

"We might use the rough pasture across the road

from the house. The trouble is that the ground isn't suitable. Besides I'd rather have the chickens among the apple trees—— Well, we'll see about that, later."

They went back presently and around the house to the piazza. Aunt Emily and Peggy were sitting



Some of the Trees Were of Medium Size

on the steps. Jim joined them, but Uncle John walked through the gate into the peach orchard and looked over some of the trees carefully, from top to bottom. After a time he returned and sat down in the doorway where he could use the doorframe for a chair back to lean against.

"Well, mother," he said, "what do you think?"

"It looks good, John," she answered quietly.

Uncle John took out his knife, found the stick he had been whittling, and set to work cutting and shaping it again.

"When are we going to come here to live?" demanded Peggy.

Uncle John stopped his whittling and put away his knife.

"Well, I'll tell you what our plans are," he said. "We've leased this farm until a year from this coming December. It will take two months or so before we can arrange things in my work in the city so as to leave it. That will make it about September. So we figure on moving in time for you youngsters to enter school here."

"At the same school that Horace and Jane go to?"

"Yes. That's the one."

"But won't we stay here more than a year?"

"I think so. I think we'll stay for good. Our lease gives us the privilege of buying the place at any time up to December of next year."

Uncle John paused and looked away across the hills.

"You see, it's this way," he continued. "This farm ought to make us a good living and a nice place to live. These fruit trees haven't a great deal of fruit on them this year. What they have goes to us. By proper care and attention we ought to be

able to make them do better another year. They've been neglected. Even at that they've been bearing pretty well most years, so your Uncle David says. Those rows of berry bushes over there need pruning. They ought to do well again. Then there's the garden. That's a good location for a garden out there. The land's early and it works up well. It used to be counted one of the best gardens anywhere hereabouts. We think that we can sell quite a lot of vegetables in Milford, aside from what we'll use at home."

"We can sell blueberries," suggested Jim.

"Yes. You and Peggy might see what you can do with them. Then we think we'll start in with a good lot of chickens, and have them for an extra business, along with the fruits and vegetables."

Uncle John was silent again.

"I think we can make it go," he concluded. "But it's been a long time since I lived in the country. I want us to try it first for a year, and see how we come out. If it turns out all right and we find that we can make our living here, we'll buy it and make it our home for good."

CHAPTER III

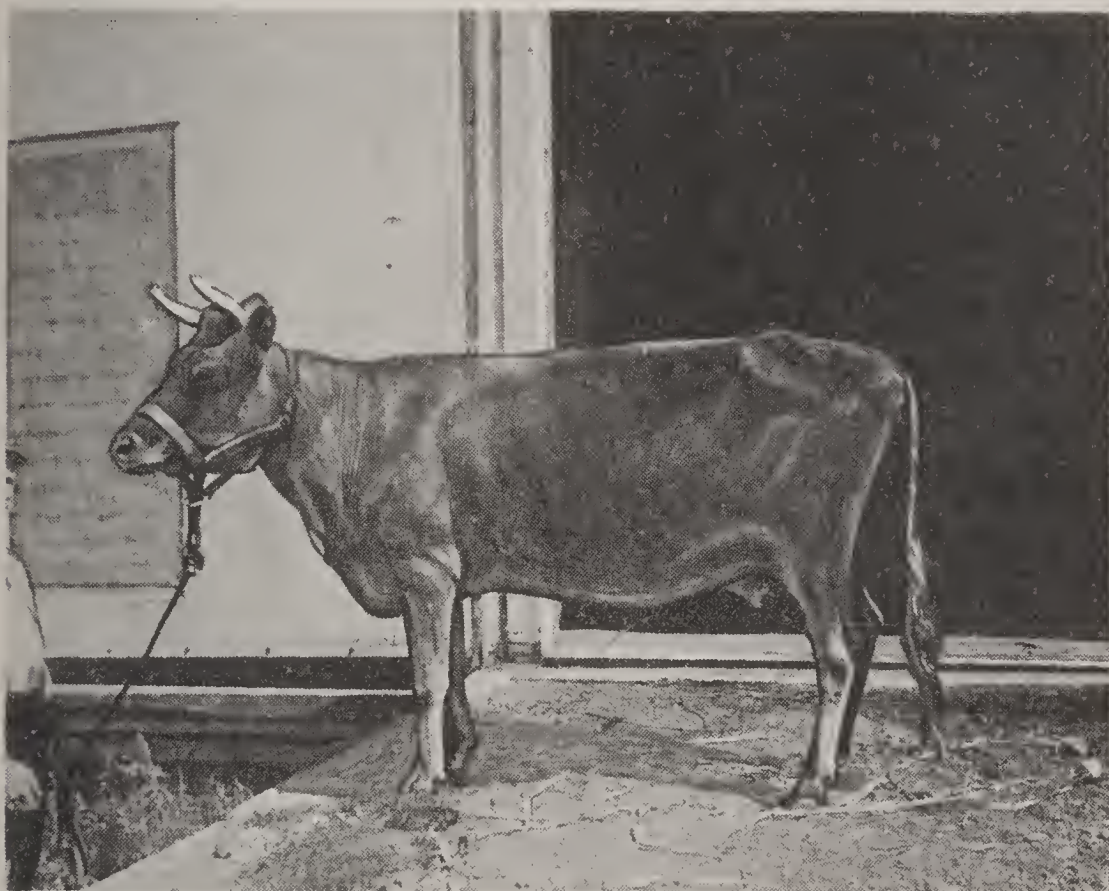
NEW ARRIVALS

It was the second week in September when they moved to Apple-top Farm. School was to begin at the close of the month, several days after it began in the city. The later date gave the boys and girls on the farms more time to help with fall work at home.

For Jim and Peggy the opening of the country school was an adventure to look forward to. But it came long before the work of getting settled in the new place was more than fairly started. There were a hundred things to do. They discovered that they were sorry to miss these new tasks and events. Each afternoon when they came back from school there was something new to look at or to think about. Saturdays were full, from daylight to dark.

For the first two weeks Uncle John borrowed a horse from Uncle David at Meadowbrook Farm. Presently Uncle David, while visiting a farm near by, found there a horse for sale that he thought would do well for the people at Apple-top. So the next afternoon, when Jim and Peggy came home, they saw their father leading out to the barn a

stocky animal with a speckled brown coat and a white "stocking" on his left hind foot. Aunt Emily said that he was just the color of Scotch heather cloth and that he ought to be called Scotty or Mac, but Uncle John said that his name was Juniper.



Cherry

Aunt Emily at once shortened it to June, which Uncle John declared sounded like a rose or a school-girl and not like a horse. Juniper himself appeared to be too good-humored to care what he was called.

A few days later there was another newcomer in the barn: a red-coated cow with a white star on her forehead. Her name proved to be Cherry. She

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seemed to be about to fly into a panic the first day in her new quarters, but the next morning had settled down as if she had been there all her life.

A dozen hens followed. When spring came, Aunt Emily said, they would start a real flock with a lot of baby chicks, or possibly would buy an incubator and hatch their own. But for the fall and winter there would be only these hens. The dozen ought to supply the family with eggs to eat and possibly a few once in a while to sell.

An important arrival followed the hens. At the Reynolds farm, down the road beyond Uncle David's place, there were four half-grown dogs, cousins of Spot and Tag that Jim and Peggy had played with through the past year. One of these dogs was sent up to Apple-top Farm as a present. It took a week to name him. Each person in the family had a different suggestion to make. Finally, Aunt Emily settled the matter by calling him Gallup, because he spent much of his time running about here and there as fast as he could go, his ears flopping and his nose near the ground.

Early on Saturday afternoon a stranger drove into the yard and hitched his horse to the post near the side piazza. He proved to be an agent for a nursery company selling young fruit trees to set out.

Uncle John talked with him while Jim stood near by and listened.

“Guess there isn’t much chance of selling trees to us this year,” said Uncle John. “I’d like to set some out. Wouldn’t mind planting two or three hundred. But we’re not sure yet that we’ll stay on this place. Can’t tell until this time next year.”



Gallup

“You’ll keep it, all right,” declared the agent. “It’s a good fruit farm. You won’t find any better in this section.”

He talked with them a few minutes longer and finally suggested that they order just a few trees to set out in the “blanks” in the young orchard—the places in the rows where trees had died and never had been replaced. They all walked over to the

orchard and counted the blanks. There were seventeen.

"All right," said Uncle John. "We'll take a chance on it that far. Don't like to let a year go by without planting, even if some other fellow gets the benefit of it."

"How about varieties?" asked the agent.

"These are all Baldwins in this orchard," said Uncle John. "That's the kind to send. We wouldn't want to mix in other varieties. There are early apples of several kinds around the house; enough for home use. But over here this block is intended to be a commercial orchard, and I think it's best to stick to staple kinds and plant them in solid rows."

"What do you mean—solid rows'?" asked Jim.

"Each row all one variety," explained Uncle John. "Or even a whole block all one kind. You can do your spraying better that way because they all come out in leaf at the same time and they all bloom at once. When you pick the fruit you have an advantage, too, because they're all ready to pick at the same time, and you don't have different sorts to keep separate. Sometimes they plant first one row of one kind then another row of another kind, then the third row the same as the first, and so on. And sometimes they'll divide a whole block into three or four sections and plant one kind in each. Over here they're all Baldwins in the whole block. That's because the Baldwin is considered a safe, reliable



They Bought a Dozen Hens

apple in this part of the country, and always finds a good sale. In other states they'd probably stick to something else—Ben Davis, maybe, or Rome or Jonathan."

"How many kinds of apples are there?" Jim asked.

Uncle John turned to the tree agent. "What would you say?" he queried.

"Goodness knows," he laughed. "We must have thirty more in our catalog, and I suppose there are a hundred or two besides those."

"Not all of them are planted much," explained Uncle John to Jim. "There are a good many varieties that you seldom see. They're mostly for home use or to please some one's special fancy. Then there are nurserymen that advertise special varieties that they have originated and are trying to build up a sale for."

"How do they 'originate' them?" asked Jim.

"Well," said Uncle John, "that's a whole story in itself. One of these times when we have a spare evening, we'll talk about that. There's a book at the house that tells about it."

A few weeks later a bundle arrived from the nursery. Old Eben, who delivered the mail on the route, brought it and waited at the box in front of the house while Peggy went out to get it. He explained that he thought it ought not to stay outside in the sun.

It seemed like a very small bundle, considering that it was supposed to contain seventeen trees. There was packing about the roots, with burlap wrapped and tied over it. This was moist. You could see wet moss by looking under a fold of the burlap. The whole bundle was about four or five feet long. The upper part was wrapped with tough strands that looked like dried grass. There were no leaves to be seen—only bare stems and twigs.

After dinner Uncle John took a spade and empty pail and started with Jim and Peggy for the orchard across the brook. Jim carried the bundle of trees, still tightly wrapped and tied, and Peggy brought a pair of small pruning shears, with a short, broad blade and a spring under the handle to keep them open except when you squeezed them shut.

At the brook Uncle John filled the pail with water. He dipped the lower end of the bundle of trees into the brook, also soaking the burlap and the packing, so that a stream of water ran out from it when he lifted it out.

They went first to one of the places where a tree was to be planted. Uncle John had Jim go a little way off along the row of trees and sight down the row across the space where the new tree was to stand. Peggy did the same thing along the row running at right angles. Then Uncle John stood his spade up and moved it about until it was just in line with both of the rows.

At that point he dug a hole, making it about two feet across and a foot or more deep. It seemed like a ridiculously large hole for so small a tree—as if one were going to put on a shoe that was as big as a bushel basket. But Uncle John said that the roots of the little tree must have loose ground to grow in so that they could easily spread out. As Uncle John dug he made two piles of earth, at one side the brown, rich-looking soil from the top and at the other the yellowish soil from the bottom of the hole. The first pile, he said, was rich earth, with plenty of plant food in it, and would be good to place around the roots of the tree.

Then he opened the bundle, took out a tree, and carefully put the moss and burlap back over the rest, to keep them moist. The roots were a mat of fine, little strands. He had Peggy hold the tree upright in the center of the hole. Then he and Jim shoveled in the top soil, working the earth in around the roots with their hands. When they had the hole half filled Uncle John pressed the earth down with his foot, bearing his whole weight on it. Next they shoveled in the yellowish soil. As they scraped in the last of it Uncle John kept stamping it with his foot.

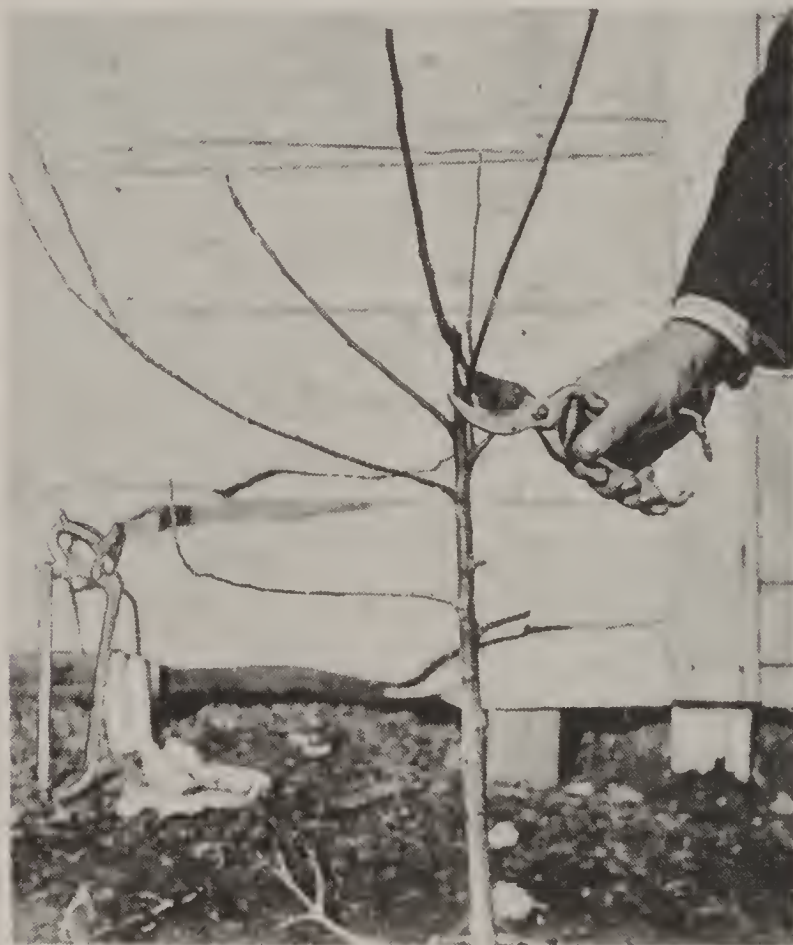
Last of all he emptied the whole bucket of water on the earth that they had filled in, pouring it slowly so that it might have plenty of time to sink in.

When the tree was in place Uncle John took the pruning shears and cut off almost all of the slender

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branches. One, in the center, the one that ran most nearly straight up, he left in place. But the side ones he cut off about two or three inches from the main stem.

Peggy wanted to know why he did this.



Pruning the Top of a Young Tree

“First,” said Uncle John, “it’s because the tree would have too much top for its roots, when it starts growing next spring, unless we did this. You know, when they dig it up in the nursery they’re bound to break off a lot of the little rootlets. They can’t help it. So by pruning it this way we make the upper

part correspond better to the roots. Then we want our tree to send out a low framework of branches, so that it will head not too far from the ground. When we cut off these side twigs we make the buds start up on the stub that's left, and as those grow they'll make branches later. Then we'll have a tree that won't grow away up toward the sky, as some trees do. We can spray it and pick the fruit without climbing up on a tall ladder."

Each of the other little trees they planted in the same way. Each time Uncle John went down the slope to the brook and carried up a full pail of water. "Now," he said, "those trees can't complain that they haven't had a good drink."

When they finished and walked back to the house they found a man sitting in a buggy in the yard, waiting to see Uncle John. The two of them talked together a few minutes and then started out through the orchard back of the barn. Half an hour later they came back and the visitor drove away. Uncle John went into the house to talk with Aunt Emily and after a time walked down to see Uncle David.

At supper he told Jim and Peggy what it was about.

"We've sold our apple crop," he said. "Sold it on the trees. The man that was here was a buyer. He furnishes the barrels and does the picking, and he pays us so much a barrel for the crop, just as it is."

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"Why don't we pick them?" asked Peggy.

"Next year we will. But this year it would be hard to arrange. Beginning Monday I'm going to be working for your Uncle David all this fall. That will take a good deal of my time, and won't leave much for a job such as apple-picking. When next season comes we'll have things running in regular order and we'll take care of our own crop."

"Does he pay us much for the apples?" asked Jim.

"Two dollars a barrel. He thinks that perhaps there will be seventy-five barrels."

"That makes lots of money, doesn't it?" remarked Jim.

"Not when you come to buy equipment and supplies. But it will help. This farm ought to do a good deal more than that; maybe two hundred barrels, with the trees that are in bearing now. Perhaps even more than that. We'll make it do its part, in time."

CHAPTER IV

BRUSH HEAP AND BRIARS

A FEW days after the young trees had been set out Uncle John went to Milford one afternoon for supplies. His list of errands was a long one. In fact it seemed as if there were always at least a dozen different things needed from the stores in town, just as there were always various tasks that needed to be done around the farm.

That was part of the job of getting started. Later, when the farm was in running order, the errands to be taken care of at Milford would grow less in number, because the farm would accumulate its own stock of supplies: nails, screws, hammers, saws, hoes, rakes, brushes, and a hundred other items. Later, too, the work would grow more systematic and would seem less crowded, although Apple-top, like every other farm, would always be a busy place where you would have plenty to do if you wished to keep it moving and in good order.

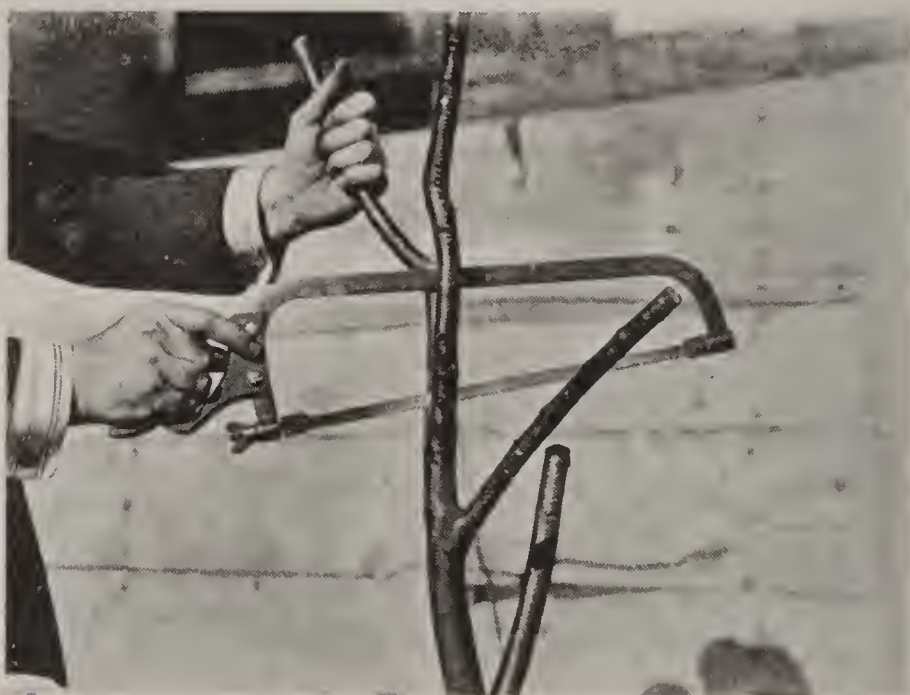
With his other purchases Uncle John brought home a can of tar paint. From Uncle David that evening he borrowed an extra pair of nippers, like

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the pair that he'd used in pruning the young apple trees and a small saw with a narrow, curved blade.

"To-morrow's Saturday," he remarked to Jim and Peggy. "Let's tackle two or three of those old sky-scraper apple trees and see what we can make of them."

"But you said you wouldn't fix up the old trees



One Kind of Pruning Saw

until you knew whether we'd stay on the place!" objected Aunt Emily.

"Yes, I know. That's what I said," laughed Uncle John. "But we're going to do only a few of them. Just three or four near the house. It doesn't seem right, somehow, to let them all go. I hate to see them the way they are.

"Besides," he added, "if we are going to keep

Apple-top Farm we don't want to lose too much time making it shipshape."

"Well, you wouldn't be contented unless you were working at it," declared Aunt Emily.

In the morning Uncle John brought a long ladder from the barn and stood it up in a tree in the hayfield that extended westward from the house. Jim and Peggy carried out the can of tar paint, a wide brush, the pruning nippers, and the curved saw.

Uncle John walked around the tree, looking at it from different sides. He shook his head.

"Might as well go right at those middle limbs," he said. "You see, there are three of them that run almost straight up and haven't any side branches until they get up thirty feet or more. Don't have many branches even then. You can't take care of fruit on limbs like that."

The ladder reached only to the middle part of the high limbs. Uncle John adjusted it carefully and tried to see that it stood securely. Then he took the saw and climbed up. Just above the lowest side branch of one of the tall limbs he began his cut. First he sawed into the limb from the under side as far as he could, until the saw began to bind because the weight of the limb closed the cut. Then he sawed from the upper side, doing it carefully so that the two cuts would meet.

Presently the limb began to sag. Uncle John stepped off the ladder into a crotch of one of the

other limbs, from which he could just manage to reach with the saw and give it a few more strokes. Suddenly the limb snapped and fell through the twigs and branches to the ground. A smooth surface was left, where it had been cut off.

"That makes a good, clean stub," called Uncle John. "If you start first on the under side and then finish on the upper the limb won't split away. Sometimes people don't do that and they make a bad, ragged scar. Rot gets in and maybe the part of the limb that's left dies."

The two other tall limbs followed the first. With each one Uncle John selected a place for his cut where there were side branches just below. These, he explained, would grow larger, when the tall, upright limb beyond was out of the way. The tree would have a chance to make a low, spreading head instead of a tall, ungainly one.

When the sawing was finished Uncle John carried the tar paint and brush up the ladder and carefully painted each bare stub.

"If you keep out moisture," he said, "the cuts will probably heal over. The bark at the edge of the cut will have a tendency to grow out over it. Sometimes it won't entirely cover it on big stubs like these, but often it will, in time, provided there's a side branch or a twig or even a bud close to the cut to help feed the bark and make it grow."

There was another limb, lower down, near the

center of the tree, that Uncle John decided to take out. It interfered with neighboring branches, he said, and should not be there. If it were out of the way the tree would be more open in the middle, which was another quality that it needed. So he cut out that limb, back to the main body of the tree, not



The Stub Left When a Limb is Not Rightly Cut

leaving any side branch. "That's enough limbs to saw off just now," he concluded. "There are three or four others to come off later."

"Why not do them now?" asked Peggy.

"It isn't best to cut off so many all at once," said Uncle John. "It throws the tree out of balance too much. You see, we don't touch the roots any. They are just as numerous as they were. If we cut off too

many limbs there will be so many roots in proportion to the top next spring that the tree will make a bad growth of long twigs and not do well at all. These other limbs we can take off some other year, if we're here."

With his pocketknife he next trimmed off a dozen or more long, slender shoots that grew straight up from the main body of the tree. Water sprouts, he called them. They were of no value, he explained, and ought to be trimmed off close as soon as they started. Such sprouts, starting when the tree was small, might have developed into good limbs, but now they would never be of any use.

Two more of the big apple trees were remodeled in the same fashion as the first one. That made enough climbing and sawing for one day, and by then it was dinner time. Jim carried the saw and paint can back to the house. Peggy carried the nippers.

"What are we going to use these for?" she asked.

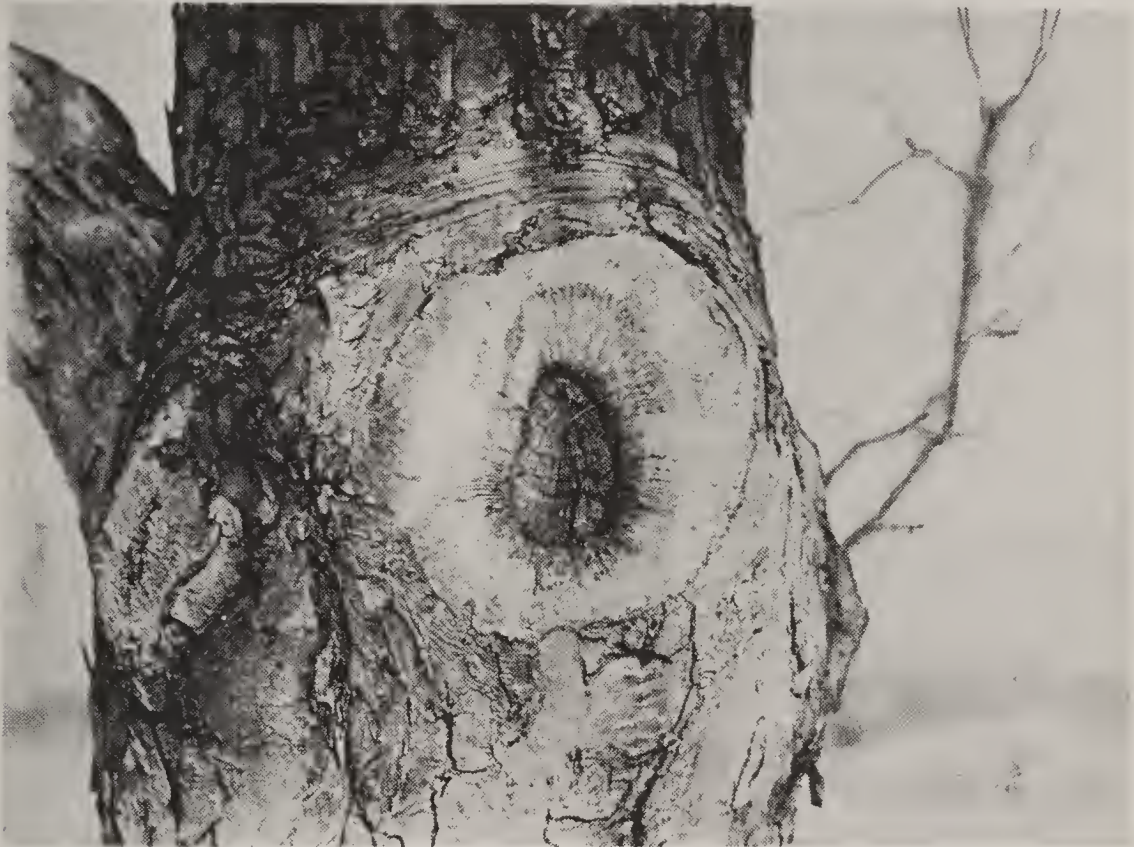
"Going to use them on the briar patch," said her father.

So, when dinner was over they paid a visit to the long rows of blackberry and raspberry bushes alongside the garden. But first Uncle John put on an old pair of gloves, and found another pair that Jim and Peggy could divide between them.

Trimming a berry patch looked to be a very different job from pruning an apple tree, and so it was.

The task here was to cut out all the old canes or shoots, leaving only those that had grown the past summer.

“You see,” said Uncle John, “a berry bush sends up some new shoots every year from the roots. The second year after a new shoot comes up is the best



If the Cut Is Rightly Made It Heals Over

year for fruit on it. The first year it's doing its growing, and doesn't have time to bear blossoms and fruit. By the time the third year comes around it is past its prime and won't do as well as it did the second season. So we want to cut off the old shoots close to the ground, and get them out of the way. Then the roots can put their strength into making fruit on the shoots that we leave and sending up

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other new shoots for the following year. That's what we'll do every season. Always prune out the old stalks. Then we'll have lots of good berries."

It was prickly business. Uncle John did most of the cutting, while Jim helped now and then. Peggy carried the pruned shoots out into an open space where there had been a garden. She piled them up there, to be burned when they were dry. They didn't have time enough to finish the patch that afternoon and besides it was such a scratchy task that Uncle John decided to stop after they'd finished one row.

"We'll do the grapevines," he said, "and then it will be time for chores."

There was only one short row of the grapes. Along this row two wires were stretched, the lower one about eighteen inches from the ground, the upper one two feet higher. The wires were fastened to posts at each end of the row, and the vines were partly tied to the wires, partly lying on the ground. Uncle John straightened out the vines and trimmed them so as to leave on each separate vine a pair of strong shoots for the lower wire and a pair for the upper. Peggy went to the tool house and brought some stout twine. With this they tied the vines to their supports, arranging them so that there was a shoot extending each way along each wire.

"How about the peach trees?" asked Peggy, as they stood looking at the results of their work.

“They’re different,” said Uncle John. “We don’t try to prune them as we would those old apple trees. They’re younger, anyhow. If a limb breaks we’ll take it out. But we’ll not make any wholesale job of it.



Berry Bushes that Have Been Pruned

“You know,” he added, “a peach orchard isn’t supposed to grow as long as an apple orchard. A peach tree gets old faster. So you don’t try to keep them in working order as long.”

“How old does an apple tree grow?” asked Jim.

“What do you guess?” said Uncle John.

“Well,” speculated Peggy, “a turtle grows to be a thousand years old. And an apple tree’s bigger than a turtle.”

“How about an elephant?” demanded Jim.

“Guess you can’t go entirely by size,” laughed Uncle John. “A horse is bigger than we are, but he doesn’t live as long. Of course the biggest trees in the world happen to be the oldest ones, the redwoods out in California. You know they say they are three thousand years old, some of them. But about apple trees, they’re often good, productive trees when they’re sixty years old or more, and sometimes they live to be a hundred.”

“Do you suppose those that we pruned were as old as that?” asked Peggy.

“They’re hardly a hundred. But I think they’re getting on in that direction. Probably they’re over sixty. They’ve borne lots of fruit in their time. They’ve earned their way.”

CHAPTER V

FOUR-FOOTED VISITORS

UNCLE JOHN was rummaging about in the barn and the tool house. Something that he was in search of seemed to have disappeared, as if it had grown wings and flown away.

He went to the door leading into the kitchen.

"Say, Jim," he called, "have you seen anything of some pieces of wire screen?"

Jim came out from the dining room, where he was finishing dinner.

"What kind of screen?" he asked.

"Why, just plain wire screen, like what we used to have tacked over our cellar windows in town. There were several squares of it somewhere in the barn, I thought."

"I know," nodded Jim. "I took it out to the hen-house to make coops for chickens."

"Well, we can use some coarser wire for that. I want this for tree protectors."

Peggy had heard the discussion and now joined them.

"It's for the little trees, isn't it?" she said. "I saw a picture of them in a fruit magazine."

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“Protectors,” commented Jim. “What for?”

“He’ll see,” answered Peggy. “Won’t he, daddy?”

“Oh, shucks!” objected Jim. “I’ll bet I know, too.”

They walked over to the henhouse and Jim brought out the pieces of wire screen. Uncle John had a pair of heavy shears with him, stout enough to cut tin. With these he cut the wire screen into sections about twelve inches wide by fifteen inches long. Some were a little shorter because the wire was in odd pieces. Jim carried the shears and the left-over pieces to the tool house.

Taking the wire sections along they all went to the orchard beyond the spring, the place where they had set out the young apple trees to fill in spaces where other trees had died.

“Here’s the reason we’re going to use protectors on these little trees,” said Uncle John. He stooped down and pointed out a scar on the trunk of one of the older trees, near the ground. Looking closely you could see that the bark had been gnawed off fully a third of the way around the tree. The scar was an old one, as if it had been made a year or more before.

“That’s just what I meant!” declared Peggy. “Protectors are to keep rabbits from gnawing trees.”

“Rabbits, sometimes. That’s right,” said Uncle

John. "But often it's mice. That's what did the gnawing this time, I think. Look closely. See the little, tiny teeth marks?"

Jim and Peggy got down on their hands and knees and examined the scar.



The Work of Mice

"Do they ever kill a tree?" asked Jim.

"Often," said Uncle John. "Especially young trees. If they gnaw the bark all the way around, the tree will die because there won't be any way for the sap to get up to the branches and leaves."

"Why not?"

"I read about that, too," interrupted Peggy. "The sap goes up in the bark. The trunk inside doesn't have any sap in it. That is, not much, anyhow. Not what the tree has to have."

"Most likely," suggested Uncle John, "the reason there are blanks in this orchard, is because mice or rabbits killed some of the trees. We don't want to let them kill the trees that we have set out in place of the dead ones."

He took a section of the wire and bent it so that it had the shape of a cylinder. This he slipped around the trunk of one of the little trees, bringing the edges together and lapping them after he had it on. It made a sort of tall collar around the tree. Uncle John pushed the collar firmly against the ground.

"Can't mice climb up over the wire?" asked Jim.

"They can, but they won't," said Peggy. "I read about that, too, in the magazine."

"Once in a while they do, though," said her father. "Rabbits will stand up and eat the bark above the wire sometimes. But usually they let it alone, and you can count on it that the tree will likely come through the winter all right."

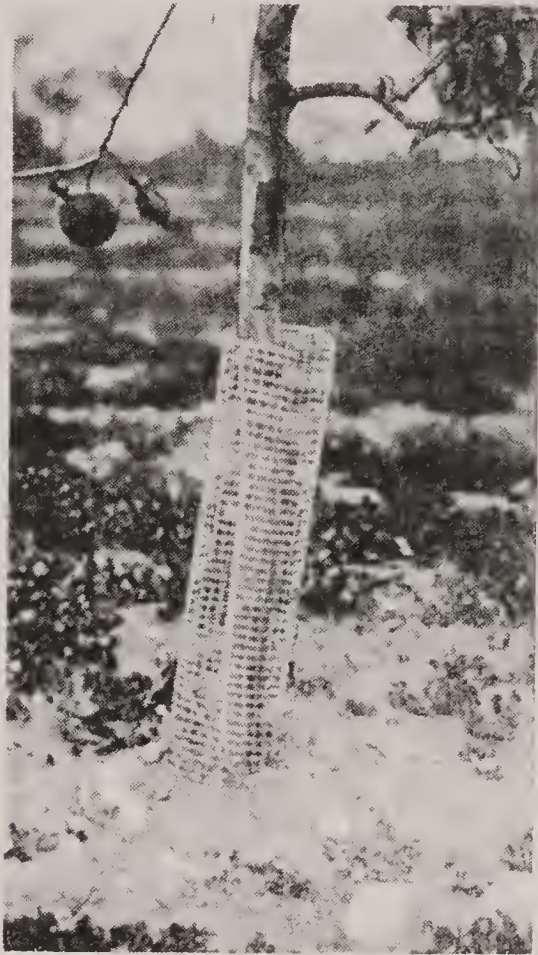
"Is it just in winter that they gnaw trees?" asked Peggy.

"Sure!" declared Jim. "I know about that. They eat garden stuff and grass and things in summer."

"Mice don't eat grass!"

“Well, they have plenty of other things in summer.”

They examined other trees near by and found two or three more scars.



A Wire Tree Protector

“What can you use if you haven’t any wire?” asked Peggy.

“Some people use tarred paper,” answered her father. “They cut it in sections like this wire screen and tie it around the trunk. Some use thin sections of wood that are made for the purpose, wood

veneer. Sometimes a man just takes old newspapers and wraps them around the trunk: several thicknesses of them. Paper and wood veneer must be taken off in summer, because they don't give the bark of the tree a chance to have sunlight as it should.

"There's one thing about these other protectors, though," he added. "You can leave them on through spring, up to a certain time, and keep borers out of the trunk."

"Worms and things?"

"Yes, the borer that gets into the trunks of apple trees. The round-headed borer, they call it. As I understand it, there's a beetle that lays eggs on the trunk near the ground, and the grubs come from these eggs. If you have protectors on while the beetles are around, they can't get at the tree to lay their eggs—not at the place they want. The grubs do lots of damage to young trees sometimes. They kill a good many."

"Won't our wire do?"

"No, it's too coarse. The beetles could crawl right through it. You can use fine wire if you like. Some people do."

There had been a frost that morning. The ground had been white when they got up. Uncle John pointed to three or four tall trees standing along the stone wall at the farther side of the field where the young orchard was planted.

“Why don’t you two go and gather hickory nuts,” he suggested, “while I finish fixing these trees? I’ve got some other jobs to do just now, too.”

Jim and Peggy went back to the barn for a basket. When they reached the hickory trees they found some nuts scattered here and there in the grass, but there were not enough to fill the basket more than half full.

As they hunted about a noise began, high over their head, a sort of jerky bark with a queer chattering. A squirrel sat on a limb, looking down at them. Each time he exploded in a bark his long tail jerked. He ran farther out along the limb until he reached the very end of it, and then jumped across from the last twig to the tip of a limb that projected from the next tree. Along that he raced to the trunk, then up and out on another limb, where he stopped and began chattering and barking again. Soon another squirrel that had kept silent and hidden, lying on top of a big limb where you could not see him from below, began to bark in the same way.

“They’ve got our nuts,” said Jim. “All except the ones in the basket. They don’t want us to have those others.”

That seemed to be the way of it, for Jim and Peggy knew that there had been lots of nuts on the trees. But they concluded that the squirrels needed the nuts anyhow, for winter food supplies.

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Besides, Jim and Peggy had lived there for only two or three months, but the squirrels probably had been there for years. So it was a question as to who could best lay claim to the nuts.

“Next year,” declared Peggy, “maybe we’ll



From the Nut Trees

divide with them, but we’re going to have a basket full for ourselves.”

When they got back to the house they told Uncle John about it.

“All right,” he said. “I’m laying up food supplies, too, and you can help me with that.”

He was gathering into a pile the old plant stalks and dead weeds from the garden. There were

pieces of old sod, dug up when a drain had been laid, and all sorts of dead leaves and grass.

“This won’t be any good for a while,” said Uncle John, “but after it rots down and we mix earth with it we’ll have plant food for our hotbeds and flats. Out here it will freeze and thaw, and that will help.”

He said that stable manure was about the best material to make the soil rich for garden uses, but the manure should be well rotted. They’d add some of that, too. The reason for saving the old weeds and plant stalks was to put them to good use.

“Why does manure have to be rotted?” asked Jim.

“I can’t tell you just exactly why,” said Uncle John. “That is, I don’t know what you would call the chemistry of it. You’ll have to study that some time. It must be interesting. But I know that fresh stable manure isn’t as good for a garden as manure that’s older.”

He went on then to explain that many vegetables need a rich soil to make them grow rapidly: the kind of a soil that is usually spoken of as loam.

“We’ll need some loam early in the spring,” he said, “long before this pile is of any account. We’ll have to have some for our flats that we start seeds in, and for a hotbed. Probably the ground will still be frozen then, so we’d better lay in a stock where it won’t freeze.”

They discussed various places and finally decided on the barn cellar.

"It will freeze some down there," said Uncle John, "but we'll fix that."

So they picked out a corner of the cellar and brought in several wheelbarrow loads of rich earth that they shoveled up in the garden. Uncle John selected a place there next to the fence. He took a rule from his pocket and marked off a rectangle about six feet wide by ten feet long. They filled the barrow several times with the top soil from this space.

"Now let's get some more vines and weeds," suggested Uncle John.

These they piled in a thick layer on top of the heap of earth in the cellar to protect it from frost.

"We're not so different from the squirrels, after all," laughed Uncle John. "They get ready for winter and so do we."

"We aren't going to eat that dirt, though!" objected Peggy.

"No. But when this place is in running order we'll have a good root cellar and we'll store things that we will eat. Potatoes and cabbages and carrots. And in the house we'll have beans and squashes and various other supplies. And lots of canned things that we'll put up ourselves. That's one reason for living on a farm. You can have things the way you want them."



Uncle John's Compost Pile

“How about apples?”

“We nearly forgot those, didn’t we? Well, I hope we’ll have enough of them to need a whole storage house just for them alone.

“But that’s not this year,” he added. “I wish it were.”

He stooped and took up the handles of the wheelbarrow.

“Now I’ve got another job to start,” he said, “so that we can use that loam that’s in the cellar.”

With Jim and Peggy following he went to the place in the garden where they had got the loam, and began to dig more soil out of the rectangular space, throwing it out to each side.

“It’s easier to do it now,” he remarked, “than it will be next spring when the ground’s frozen.”

“What’s it for?” asked Jim.

“Guess.”

“A root cellar?”

“No. We wouldn’t need that next spring, would we?”

“I’ll bet I know!” said Peggy. “It’s going to be a hotbed.”

“Right you are,” said Uncle John.

CHAPTER VI

THE FRIENDLY BIRDS

PEGGY stood looking out of the dining-room window. It was a cool day—the kind that made you think of the winter that would soon be making its appearance. Sunday dinner was just finished.

“There’s that old crow again,” Peggy remarked. “I think it must be the same one that comes every day and walks around in the garden.”

“How can you tell it’s the same one?” demanded Jim. “They all look alike.”

“Well, he acts like the same one, anyway.

“Daddy,” she continued, “what is he after in the garden?”

“Probably most anything that’s good to eat,” said Uncle John.

“But what do crows eat?”

“Folks will tell you they eat corn. They do, too. Often they’ll dig up the seed corn before it shows above the ground. Sometimes, when the corn is coming up, they’ll go along the rows and pull up the young plants.”

“Is that why they put up scarecrows?”

“Yes, it’s to drive them away from fields just

planted to corn. Sometimes they shoot a crow and hang him up from a stake, to scare other crows away. Often they hang up old pieces of cloth, or old tin pans. But I've heard of a better scheme than that."



Looking for a Bird's Nest in a Hollow

"Tell us about it."

"An old farmer friend told me that he took a measure of corn and scattered it here and there in the field, on top of the ground. The crows would notice it right away, he said, and they'd begin to

hunt for it. They wouldn't pull up the sprouted corn or dig for the seed corn but would look for the grain on top. By that scheme, he said, he didn't lose any of his planted corn and he had the benefit of the crows' eating up bugs that they'd find as they hunted around."

"Do they eat many bugs?"

"Well, it's funny. If you talk to a farmer he'll probably tell you that a crow does nothing but harm. He'll say he's a thief and a rascal, and ought to be killed. But some of the men that work for the government in the department of agriculture study what birds eat. They say that taking the average of the whole year the crow is all right. He does some damage, but he eats so many insects and other things that are harmful that he ought to be considered a friend, after all."

"Let's see if we can tell what that one in the garden is eating," suggested Peggy.

They watched him through the window for a few minutes. He was walking about, sometimes among weeds, or grass, sometimes near the place where Uncle John had shoveled out earth for the hotbed. Often he stopped and appeared to pick up something from the ground. But they couldn't tell what it was.

When they opened the door quietly he saw them instantly and flew away. They walked out to the garden and looked about in the places where he had

been, but they could find nothing that would give a clue as to what he had been eating.

“How can they tell what a bird eats?” asked Jim.

“They can find out a good deal about some birds by watching them feed, I think,” said Uncle John. “But they get their best information by killing some of them and examining their stomachs.”

“Really kill them?” asked Peggy.

“Yes. A few of them. It does seem a pity, but it’s all right when you think it over. If a certain kind of a bird is a good helper, and you can prove it, you’ll be able to persuade people to protect it, and after a time it will become plentiful. It gives the bird a clear record. Just like the crow, here. If the bird is under suspicion and the examinations prove that it really destroys fruit or grain or chases away other birds, then we know that it probably ought to be killed.”

“Hawks are bad, aren’t they?”

“Not all of them. Some of them live on mice and small animals like that, and they are really beneficial. They ought to be protected instead of being shot. The same thing is true about some of the owls.”

“I read once that birds help in orchards,” said Peggy.

“Maybe I can show you something,” continued Uncle John.

They walked out into the field where the big old

apple trees stood, and Uncle John began to look closely at the trunk and limbs of one of the trees. Presently he pointed out a piece of loose bark. There was a small, ragged hole through it, about half as big as a lead pencil. He pulled off the piece of bark and turned it over. On the under side there had been a cocoon. You could see the margin of silk where it had been. The hole was opposite the center of it, and the occupant of the cocoon, whatever it had been, was gone.

"That was an apple worm in there," said Uncle John. "They call it the codling moth worm. It's the one that eats a hole around the core of the apple. Then it goes to some hiding place like this and makes a cocoon. A bird came along and pecked a hole through the bark and got it."

"How did the bird know it was there?"

"I don't know. Maybe it could hear it move."

"What kind of a bird was it?"

"We'll have to look that up. I read about it in that bulletin about birds. I really never saw one before. When we get back to the house we'll hunt it up in the bulletin."

Uncle John told about a place at Meriden, New Hampshire, that he had visited where birds were fed and protected. A bird sanctuary they called it. No one with a gun was allowed anywhere near. No cats were permitted to come on the place. Any harmful birds or small animals were destroyed.

“They had various ways of feeding the birds,” said Uncle John. “They’d planted bushes that have seeds or berries that birds like. Some kinds of birds were attracted by them. Then they’d built regular feeding places where they put out food, especially in winter.”



A Dining Room for Birds

“What were they like?” asked Jim.

“One kind was a sort of big box open on one side. It was on a pivot so that it could swing around easily, and it had a piece of tin or a board on top. When the wind blew it made the box swing until the opening was away from the wind. In that way the wind never blew straight into the opening, and

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neither did the rain or snow. They put seeds and grain in the box."

"Weren't the birds afraid of the box when it would swing around?"

"No, I think not. They seemed to be used to it."



A Robin's Nest

Then they had suet and bones for them," he continued. "They fastened the bones up to limbs and they put the suet behind some screen wire tacked to limbs."

"Why can't we take some of that screen wire that we had left over and fix it for suet?" asked Jim.

"Guess you can. You might try one of those swinging boxes, too. As I remember it they had a pane of glass set in each side, but I don't know whether that was so that the birds could see out or so that the folks could see in. You might try a bird house, too."

"What were they like?"

"Oh, there were different kinds. One was like a short section of a limb with a hole bored in one side and down the center. But it takes a special machine to make those. My father made two or three one time out of a limb that he found that was hollow in the center. He sawed it up into lengths about eight or ten inches long and nailed a board across the top and bottom of each one. Then he cut a hole through the side, for the bird to go in and out through. When he nailed them up in a tree, blue-birds took them over and raised families in them."

"I think I know where there's a hollow limb," said Jim.

"Well, they had others made out of small boxes. It depends on the kind of bird that you're fixing a home for. Some like one kind of a place and some another."

"Most of them make their own nests, in branches and places like that, don't they?" suggested Peggy.

"Yes, most of them do. You know some nest in the grass. You'd think they'd surely be found and killed by some enemy. But they hide their nests

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pretty well. Then there are a good many that build in bushes and thickets. And you've seen robin's nests, haven't you?"

Jim and Peggy nodded.



The Hanging Nest of the Oriole

"You know, all the robin wants is just a place that's solid enough to hold the nest. She doesn't seem to try very hard to hide it. Yet often there will be one close by a house and you'll never notice

it until after the birds have gone. Have you seen an oriole's nest?"

"I think there's one in the elm tree in front of the house," said Peggy.

"Let's go look at it," suggested Uncle John.

They walked around to the front of the house and could easily see the nest swinging from the twigs at the end of a long branch.

"We can see it better from the upstairs window," proposed Peggy.

So they went up. The nest was only a few yards away from the window. They could see that it was like a tiny, woven basket, lightly fastened to several twigs so that it hung as if by a handle.

"Cats couldn't get that," remarked Jim.

"No, and it's cats that kill a good many birds," replied Uncle John. "Folks like to have them because they're friendly companions around a house and they kill mice. But they kill birds, too. Of course the cat shouldn't be blamed, for that's its instinct. It naturally likes to hunt. Only, the birds do suffer. And we need the birds, especially around an orchard and garden."

"Let's find out about that one that made the hole in the bark and got the apple worm," said Peggy.

Uncle John found the bulletin and looked it up. It was the downy woodpecker.

"I've never seen one," said Peggy.

Uncle John was standing by the window.

“Look!” he said. “Look there! On the trunk of that apple tree! No, he’s gone behind the trunk, but he’ll be back.”

In a moment a gray-and-black bird with a red spot on the back of his neck came sidling around the trunk, zigzagging upward, pecking at the bark as he did so.

“It’s a downy,” said Uncle John.

CHAPTER VII

ADVENTURES IN CATALOGS

Two or three times Old Eben, the mail carrier, had brought interesting-looking packages and big envelopes. Uncle John was working for Uncle David North now. When he came home from work and had finished the chores he would get out the contents of these envelopes and parcels and look them over, first one and then another.

Finally, one evening, as they were finishing supper, he said, "Let's all have a look at those catalogs and make out a list. What do you say?"

Aunt Emily and Peggy finished the dishes and Uncle John spread out the catalogs and pamphlets on the sitting-room table. When they all sat down together he took a sheet of paper and wrote something at the top of it. This he folded over tightly so that it couldn't be read.

"That's a secret," he laughed. "It's a guidepost."

"I think I can guess," remarked Aunt Emily.

"Never you mind," admonished Uncle John. "I'll tell what it is later."

The catalog that was on top had come from a big dealer in the city who sold all sorts of farm imple-

ments and tools. Uncle John opened this and began to turn the pages slowly. First there were plows.

"We won't need any of those," said Uncle John. "Uncle David has an extra one that he bought at an



Catalogs

auction sale and he'll sell it to us at the same price that he gave for it. He paid only six dollars."

He wrote an item on the sheet of paper that he had made ready. "Plow, \$6.00," it read.

"Is it the kind of a plow that you ride?" asked Jim.

"No. It's just a walking plow. We'll get one of the other kind some other year, if we have good luck."

There were harrows next in the catalog: spike-tooth, spring-tooth, smoothing, disk, cutaway. Uncle John said at once that they'd need to buy a disk harrow. There was none to be borrowed for the length of time that they would be using it. They'd have need for it, now and then, through most of the season.

"If we're going to bring young apple trees along we'll have to own a disk harrow," he declared. "There's the garden to be fitted, too. And probably two or three acres of potatoes and some beans."

So he made a second entry on the sheet.

They looked at pictures of mowing machines. Uncle John hesitated. "Any farm ought to have one, of course," he said. "There is a good deal of hay to be cut on this place. Probably I could borrow one from Uncle David for this season, but I don't want to do that if it can be helped. It might get damaged."

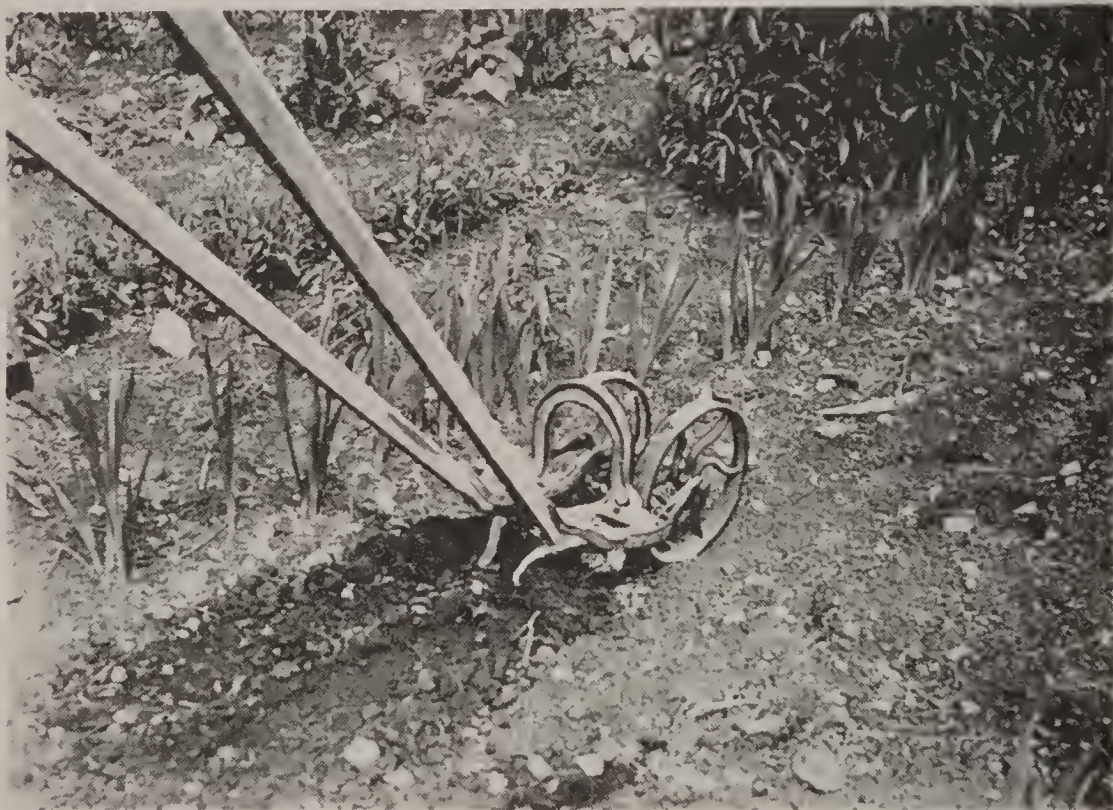
After talking it over he added the machine to the list on the sheet, but he put a question mark after it.

There were rakes and cultivators and grain drills.

"We won't need to buy a drill this season," said Uncle John. "But we must get a rake and a culti-

vator. Perhaps we can find some more secondhand tools for sale somewhere. But we can't count on that. We'll have to put them down at the prices in the catalog."

"Here's a plank drag," said Jim.



A Wheel Hoe

"There's no need to buy that," declared his father. "We can easily make one. All that we'll have to enter on our list will be enough to buy some planks and the iron fittings."

The wagons in the catalog looked spick and span. There was a picture of one printed in colors. But they already had a wagon that would do for a year or two, one that Uncle John had bought from a

neighbor. Although it had long since lost its paint there was nothing serious the matter with it.

Another section of the catalog was given over to small tools. Here they could get along with few purchases. Some things, such as hammer and saw, they had brought with them from the city. Others, such as a grindstone, were on hand in the tool shed when they came to Apple-top Farm.

Peggy found illustrations of wheel hoes.

"With the good-sized garden that we'll have, a wheel hoe would be mighty handy," suggested Uncle John.

"How does it work?" inquired Aunt Emily.

"You push it along ahead of you. There are various attachments for it, you see: little cultivator teeth that you can bolt in place, and hoe blades, and other things. Some of them have two wheels and some have one. It's the wheel that takes the weight."

Uncle John thought it over.

"We'll add it to the list for the present," he said.

In another catalog there were pictures of spray pumps. Two or three of them were fitted with gasoline engines to do the work of pumping. Others had pumps that you operated by hand. Besides these there were outfits made small enough for a man to carry. Uncle John said that in time Apple-top Farm would require a power sprayer. There were already many trees on the place. Proper care

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of them demanded good spraying applied at the right time so as to protect the trees from damage by insects and disease. Of course, you could spray an apple tree with an ordinary barrel outfit, but it took time and you couldn't do a large orchard rapidly enough to finish it in good season.

"However," he concluded, "there's the outfit in the barn and it will do for this year. We haven't so many trees but that we can manage them with a barrel pump. At least for the present. Some of them are small and don't require much time."

"How about the potatoes?" asked Aunt Emily.

"They'll need spraying, too. Several times, probably. But that can be done with the same barrel outfit. It's really a well-made rig and it's in working order. Jim and I have tried it."

Aunt Emily turned to a booklet that she had been looking over. It was a catalog of poultry equipment: incubators, brooders, and various smaller items such as food hoppers. They talked them over. Aunt Emily suggested that perhaps it would be best not to attempt to hatch their own chicks the first season. If they omitted that they could do without incubators. But they would have to get a brooder. So Uncle John entered that on the list.

The booklet that was the most attractive of all, so far as the design on the cover was concerned, was a catalog of seeds. In the front part of it were illustrations of vegetables: muskmelons with a sec-

tion cut out to show the juicy flesh inside; radishes with round, scarlet bodies, slender white tips, and dark-green leaves; string beans growing thickly on a stocky, bushy plant; and ears of corn with the husk stripped back so that you could see the tender, white grains.

They made out a list of the seeds that they would order. It was different to choose among some of the inviting varieties. The descriptions of each sounded so attractive that it seemed a pity to omit any. One of the varieties of peas, for example, was described as "very sweet and tender; should be grown in every garden," while the next one on the same page was declared to be "unusually tender and of fine flavor; no garden should be without it."

There was the difficult question, also, of the amount of each kind of seed to order. Uncle John solved that. He drew a rough diagram of the garden and marked off the rows on the paper. In a bulletin he found a table that told how many feet of row a pint or an ounce of each kind of seed would plant. With that to serve as guide, and by estimating as carefully as they could how much of each vegetable they might need, they managed to make out the list of seeds.

The back part of the same catalog showed many pictures of flowers, some of them printed in bright colors.

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“What shall we allow for flower seeds, mother?” Uncle John asked of Aunt Emily.

She shook her head and suggested that they’d better not count on buying seeds of that kind the first year. But Uncle John made an entry on the list, nevertheless.

Then he took from his pocket a letter and a printed sheet that he had received from the county agricultural agent.

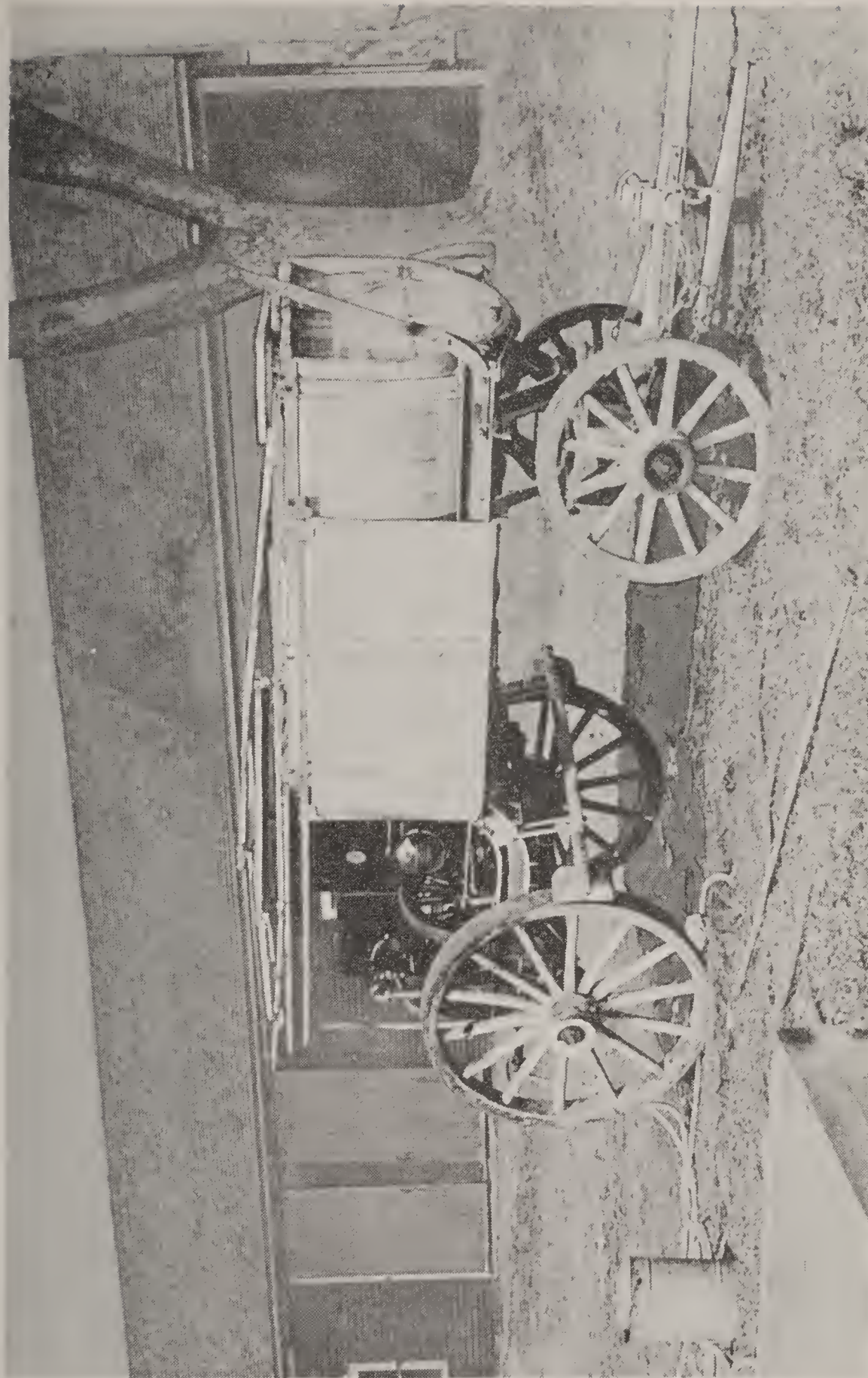
“It’s a long way from flowers to fertilizers and spray materials,” he said, “but we must make allowance for those things, too. We’ll need some commercial fertilizer for the orchard and the potatoes. Probably a little will be required for the garden, too. And we’ll have to spray.”

He had already estimated the quantities that would likely be required, and had set down the costs as he had figured them from the printed list sent out by the county agent.

“We’ll mix our own fertilizers,” he said. “That will save us some money. But it will take a considerable allowance to see us through.”

So he made another entry on the sheet where he had set down the costs of the implements and the rest.

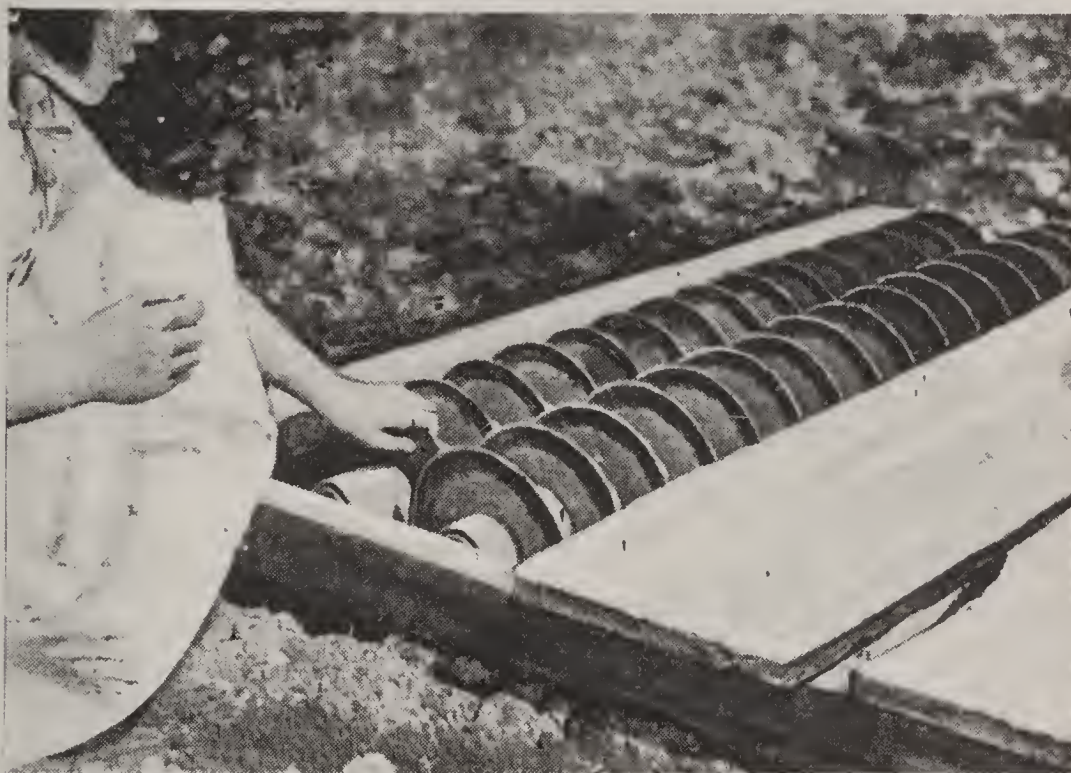
Field seeds came next. Here again Uncle John had prepared a list beforehand, after consultation with Uncle David. Then they made an entry to provide for the baby chicks that they would buy in



A Power Sprayer

the spring. And finally there was feed grain to consider, for the horse and the cow and the baby chicks. Uncle John's sheet was about full by that time.

He added up all the items, then. It made a sum that looked enormous to Jim and Peggy. For that



A Smoothing Harrow for Gardens

matter Uncle John and Aunt Emily shook their heads over it.

"Now we'll look at the guidepost," suggested Uncle John.

He turned back the fold at the top of the sheet, where he had written something before they began. There was a sum of money entered there. It was less than the total at the bottom of the sheet.

“That figure there,” he said, “is the amount that we can count on for our supplies and equipment until next summer. It isn’t enough, but it will have to do.”

He went on to explain, then. His work with Uncle David would continue through the winter until the jobs at Apple-top required all his time in the spring. He was making only ordinary wages. In fact he was taking the place of Andrew Wiggin, who ordinarily worked for Uncle David. The wages would provide living expenses for the family, since they had their own cow and chickens and their house to live in. He hoped to save some money out of what he earned, but it was best not to count on that. Sickness might come, or something else that could not be foreseen. If they succeeded in saving there would be that much more to depend on.

For their equipment of machinery and supplies they would need additional money. A check had arrived that day for the apple crop. There were seventy barrels—not quite as much as the buyer had estimated—and the amount received for them was a hundred and forty dollars. Uncle John had decided to add to this four hundred dollars from his savings account. He said that he didn’t like to use savings for current expenses, but it appeared to be necessary to do so this year. In a way, of course, it would be investment in farm equipment; or you

might look at it as a loan to the farm. At any rate, some arrangement of the kind was necessary.

The apple check and the savings amount added together made five hundred and forty dollars. It was this sum that he had written at the top of the sheet. Now the task was to make the total at the bottom of the sheet no larger than the amount at the top.

They considered each item and talked it over. The wheelbarrow they could do without. Ordinary hoes and rakes would suffice for the first year. The new mowing machine had to be omitted. Uncle John decided that he would try to borrow or rent one. The allowance for a cultivator and that for a horse rake could be reduced if secondhand ones could be found. Uncle John reduced the sum. "We'll hunt around until we find a bargain somewhere," he said.

The total was still too large. They discussed it for a long time and finally decided to reduce the number of baby chicks that they would buy.

"Probably," said Aunt Emily, "it will be wiser for us not to try to raise too many the first year. Every hundred that we get means twenty-five dollars on that list, besides the food supplies for them. Let's get five hundred instead of eight hundred."

That made the total almost small enough.

Aunt Emily pointed to the last item on the list; the allowance for flower seeds.

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“We’d better omit that,” she suggested.

Uncle John shook his head. “We’ll keep that just as it is!” he said. “Our list is all right, now.”

“Then I’m going to raise some flowers to sell,” declared Aunt Emily.

The next day Uncle John sent off the first order. Some of the items on the list would not be needed for a long time and these would not be ordered until later. But some of the supplies ought to be on hand within a few weeks. As Uncle John said, it wouldn’t hurt anything to have them on their way.

CHAPTER VIII

GOOD ENDS FROM SMALL BEGINNINGS

It was a snowy winter evening in January. The weeks had slipped by, busy with school work, then the holiday vacation and then more school work. Uncle John continued to go to Uncle David's almost every day, to take care of the duties that he had undertaken there until spring. Now, with a wood fire going in the big, old fireplace, and with supper just finished, they were all sitting in the living room.

The seed catalog, with its brightly colored cover, was lying beneath some newspapers on the table. Peggy spied the corner of it and pulled it out. She held it up and looked at the gorgeous picture of radishes and muskmelons. Then she fished out from the pile another booklet, also provided with a gay cover, but picturing on one side a spray of handsome red raspberries and on the other a twig with a beautiful crimson apple hanging from it, in the midst of rich green leaves.

"Daddy," she said, "where do all the different kinds of vegetables and fruits come from?"

Uncle John took the two booklets, held them out

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at arm's length and turned them over, half closing
his eyes.



There Are Many Different Species of Wild Plants

“I’m not so sure about all of those in the dealer’s catalogs,” he said. “Some of them just come from imagination, I suspect.”

“But how about the rest?” persisted Peggy.

“I can’t tell you all about those,” said Uncle John. “But I think I can tell you a little. Some of it, perhaps, we can look up in bulletins or books.”

He pulled his chair back from the fire and stretched out his legs.

“Of course,” he began, “there are just naturally a great many different kinds of plants in the world: wild plants, I mean.”

“Violets and buttercups and things like that?”

“Yes, and wild gooseberries and wild currants, and many other kinds of wild fruits. And lots of different plants that we could eat the leaves of or the stems or roots, if they were plentiful enough or if of good enough flavor. There are thousands of species. They’ve all been here for a very long time; some of them, no doubt, longer than others, but all of them for thousands of years, probably. You see, there are so many different kinds of places in the world—swamps and deserts, cold climates and tropics, mountain slopes and valleys, and all the various kinds of soil—that there would have to be a great many varieties of plants to fit into all of these places.”

Uncle John pointed to the half-burned log at the back of the fire.

“That hickory log,” he continued, “came from an old tree that grew up and died on Apple-top Farm. It’s a tree native to these regions. That is, it grows

wild here and all through a large part of the United States. But there are other countries where it doesn't grow at all. Either it never happened to get a start there, or it couldn't thrive or live because there were conditions that were unfavorable to it."

"Maybe there weren't any squirrels there to plant the nuts," suggested Jim.

"Well, that may be. But it's the nuts that I was going to speak of. You both know that hickory nuts are good to eat—good for human beings as well as squirrels. They've been gathered by people and stored up for food ever since we have any records. No doubt the Indians used to get them. But they are just the same nuts that have always grown wild; they are what we speak of as a native or unimproved variety."

"Could we change them?"

"Yes, no doubt we could. But it would take many years of patient effort, and no one is likely to set about it."

"How would they do it?"

"I think I can best explain that by telling you a true story."

Uncle John picked up one of the catalogs and opened it to a page that showed pictures of tomatoes. He pointed out one of these.

"It's the story of that tomato," he continued. "I'll try to tell you about it."

"Not far from the house where we lived when we

first moved to town there was a big, open space, like a dozen or more city lots all in one. All of that space was planted to tomatoes. Every year it was the same—nothing but tomatoes in the whole piece. It had been that way for several years before we moved into the neighborhood, and it continued until



Pedigreed Tomatoes

the ground was divided up into lots and sold to people who wanted to build houses; and then the tomato farm was moved to another location, out of town.

“The man who raised them was a plant breeder. When he was a young man he started out to develop an improved variety of tomato, something that

would be better than any other kind that had ever been raised. He kept steadily at it almost all his life, and the way he went about it was like this:

“When he raised his first field of tomatoes he watched every plant, right through the season, and marked those that seemed to be best. He wanted plants that bore their fruit early, and that had fruit that was smooth and of good size. He saved the seed from those plants and used that seed to raise his crop of plants the next year. Each season for a good while he kept on doing that.

“Then next he chose certain plants that were doing best and cross-pollinated those——”

“What is cross-pollinating?” asked Jim.

“Well, you know the blossom of a plant bears what looks like a brownish or yellowish dust that is called pollen. When this pollen is dusted on another blossom it helps to form the seed and fruit. The bees and other insects and the wind usually carry the pollen. But you can put paper bags over the blossoms before they open so as to keep bees away, and later when the blossom is ready you can bring pollen to it from some other plant that you have selected and dust it on with a little brush. Then the seed will be somewhat like the plant from which the pollen came and somewhat like the plant on which it grows.

“So the man kept working at his tomatoes, always selecting those that were best and uniting some

of them by cross-pollinating, and then saving the seed to plant the following year.

“In time he had developed a variety of tomato that was better than almost any others that had ever been grown. It was given his name—that name that you see there in the catalog; and you see it is still sold under that same name. Probably many thousands of people have benefited by his work. They’ve been able to have better tomatoes in their gardens than they could have had otherwise.”

Peggy picked up the catalog again and turned its pages.

“Did all these vegetables and flowers come from work like that?” she asked.

“Many of them did. But not all. A large number just came about by chance. Here is the way that happens:

“When a seedsman or a gardener is raising lots of plants he sometimes finds that there is one that is different from the rest and is better. Perhaps it is a new shade in a flower, or an extra early bean plant. If he saves the seed and plants it, the next year, off by itself where other plants can’t mix with it, it may happen that the flowers or the beans will be like the ones that he first noticed. They don’t always turn out that way. Often they don’t at all. But if they do he may have a new variety to place on the market. That is the way that many of them are started.”

Peggy was looking at the picture of the crimson apple on the booklet cover.

“With apples,” said Uncle John, “and many other fruits, our good varieties, as I understand it, are mainly the result of chance. I saw a book at Uncle

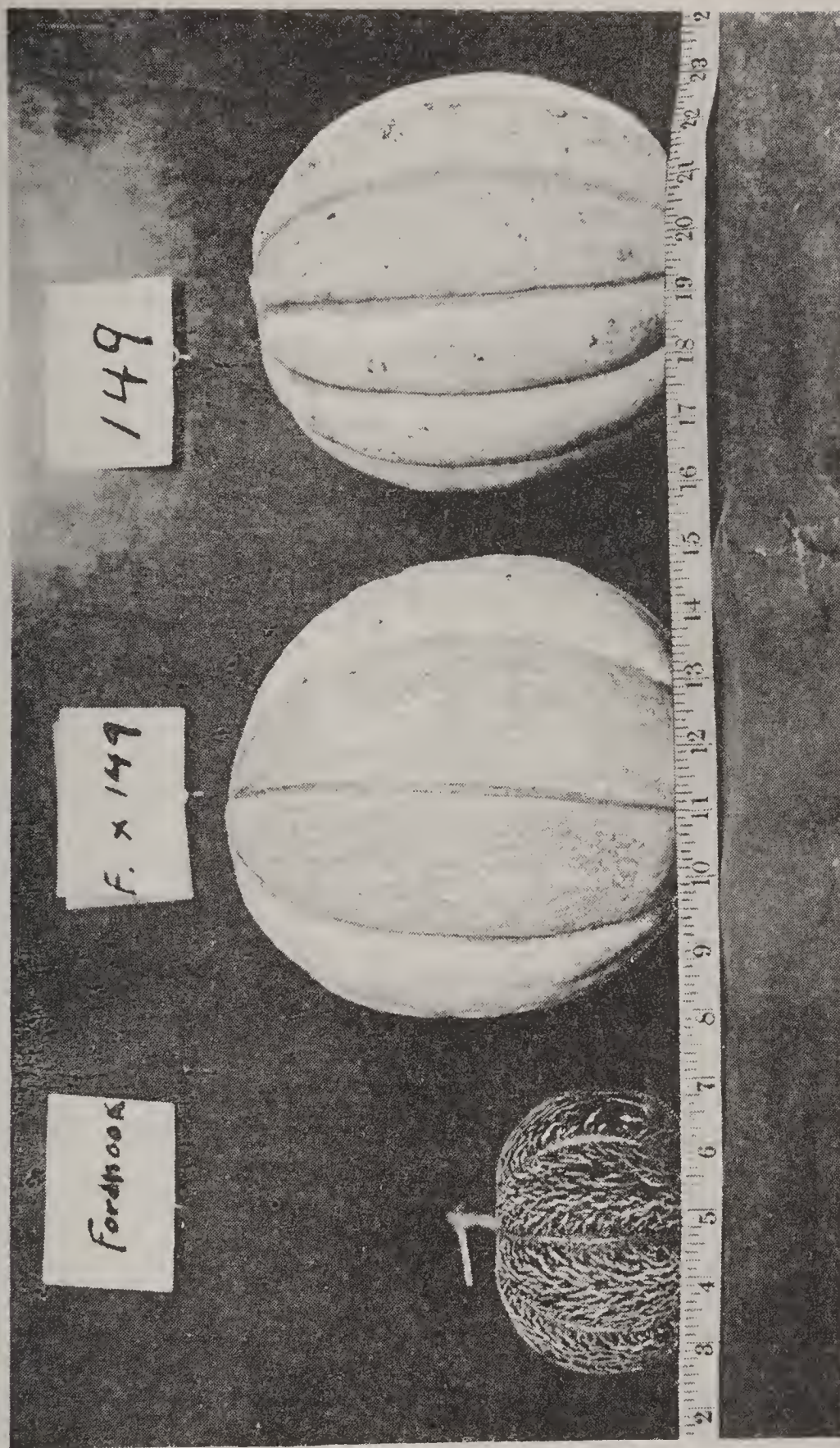


There Are Many Varieties of Apples

David's that listed nearly seven hundred varieties of apples——”

“That's a lot more than the tree man said,” interrupted Peggy. “He thought that there might be a hundred.”

“Well, of course most of them are not on the market, and he wouldn't be expected to know about them. They were never good enough to be planted by very many people. Or perhaps it would be fairer



The Melon in the Center Was Bred from the Ones at Left and Right

to say that they were not especially better than some other varieties that people already were familiar with, and so no one felt like changing and planting them.

“But what I was going to say was that only a very few varieties of apples came about by real planning on the part of a plant breeder. In the list in the book at Uncle David’s there were less than fifty where they knew how the variety started. You see it just happened that some one noticed a seedling tree that was bearing unusually good fruit, and then buds or grafts were taken from that tree to start others. A few men have really set to it and raised seedling apple trees, just like the man that I told you about raised tomatoes, and they have given us some splendid varieties.”

“Is it harder to raise the apple seedlings?” asked Peggy.

“It isn’t especially hard. But it takes a good deal of land for a thousand apple trees, as compared with tomato plants, even if the apples are planted closer together than they would be in an orchard. Most of all is the time it takes. Tomatoes and other vegetables you can check up on at the end of a few weeks. But with an apple seedling it requires six or eight years before the tree bears its first fruit, and you can’t tell anything about it all that time. Maybe you are putting time and money into the care of a thousand trees and not one will be worth saving.”

"Did the book at Uncle David's tell about plums and cherries and other fruits?"

"No, but I've been told that the history of most of the others was somewhat similar to that of the apple. They say that good work in plant breeding was done with grapes, so as to gain some of the good points of European varieties along with our own native grapes that grow wild in this country. The plums, too, were improved a good deal by breeding with varieties that grow wild in this country and with others that come from Europe. There has been lots of improvement made in peaches. When you come to the strawberry, we have dozens of varieties that plant breeders developed by crossing and uniting the good points of one sort with those of another. But strawberries, you see, are more like the vegetables to work with because they mature in a season."

Uncle John thumbed over the pages of the booklet on fruits.

"It's funny— isn't it"—he said, "that when you buy a young fruit tree, such as a Baldwin, for example, you are really getting a piece of the original tree."

"Why, how could that be?" Peggy demanded.

"It's true, in a way. Fruit trees such as apple don't come to seed. By that I mean that if you plant the seed you won't necessarily get a tree that is just the same as the one that bore the seed. So the way

it's done is to take small pieces from the original tree, which are called buds or cions, and graft them on seedlings. Of course when that tree grows large, cions can be taken from it—and so on. But in a way, you see, all of these are part of the original tree."

"Can you tell us about grafting?"

"I think that I can show you better than I can tell you. We'll have a little to do as soon as the sap begins to run this spring."

"How does it happen that we can plant vegetable seeds and have them come out the way we want?"

Uncle John studied the fire.

"I don't know that I can answer that fully," he said. "I think it's just because with vegetables and flowers they have been propagated by seed for so long that they naturally come true. Maybe that isn't a very good explanation, but it's the only one that I know."

CHAPTER IX

GLASS HOUSES

WHILE the wintry storms of January were still blowing clouds of snowflakes through the air the mailman brought the seeds that had been ordered: two packages and a cloth bag full. It seemed out of place to think of seeds and garden-making when everything was still frozen up, and of course it would be many weeks before the garden would actually be planted. But there were some kinds of plants that were to be started indoors and in a hot-bed, in order that they might be several inches tall by the time outdoor planting could begin.

"First of all," said Uncle John, "we must test the seeds and see if they are all right."

"I know about that," said Peggy. "We did some at school one time. We wrapped them in a cloth and kept it moist."

"This time I think we'll do it a little differently," suggested her father.

Jim was looking at the cloth bag.

"This one's got a tag on it that says, 'Test, 91 per cent,' " he called. "What does that mean, dad?"

“All of the seeds have been sampled,” explained Uncle John. “The dealer sends a sample to the state officials, or else they have men going around collecting samples. These are all examined to see if there are any weed seeds or other things in them that



The Seeds Had Arrived

shouldn't be there. A certain number, too, are put where it is moist and warm to find out if they will sprout all right. Then a certificate is sent to the dealer showing what the results of the tests were. He can make copies of the certificates and fasten them to the bags of seeds. That's what you found there on that bag. But when the seeds are weighed out into packages the dealer doesn't try to attach a

copy, because there are too many of the small packages to make that possible."

"But if our seeds have all been tested," proposed Peggy, "why do we have to do it too?"

"We don't have to. But we want to. You know, even if the tests have been made there is a chance that somebody made a mistake somewhere. Maybe some of the seeds came from a state where the man that did the testing didn't always do his work properly; or something might have happened since the test was made. It wouldn't make so much difference if we were going to raise the plants for fun only, but when we need to be sure that everything grows all right it's best to do some testing ourselves. Probably all the seeds are good, but we'll find out for sure."

The next afternoon, when Jim came back from school, he found Uncle John at work in the tool house. There was a supply of odd boards there. These Uncle John was sawing into sixteen-inch pieces. They found a few lengths of narrow strips, part of them two inches wide and part three inches. Uncle John told Jim to prepare from these a number of pieces fourteen inches long and an equal number eleven inches long.

These narrow pieces Uncle John nailed together to form a set of frames measuring eleven by sixteen, just like the sides of boxes two or three inches deep, without any bottoms. The boards that Uncle

John had first sawed up he now nailed on these frames to make the bottoms. When they had finished they had a dozen shallow boxes.

“These are what they call ‘flats,’ ” said Uncle John. “We’ll use some of them now for our seed-testing, and later we’ll use all of these and more like them for starting our young plants.”

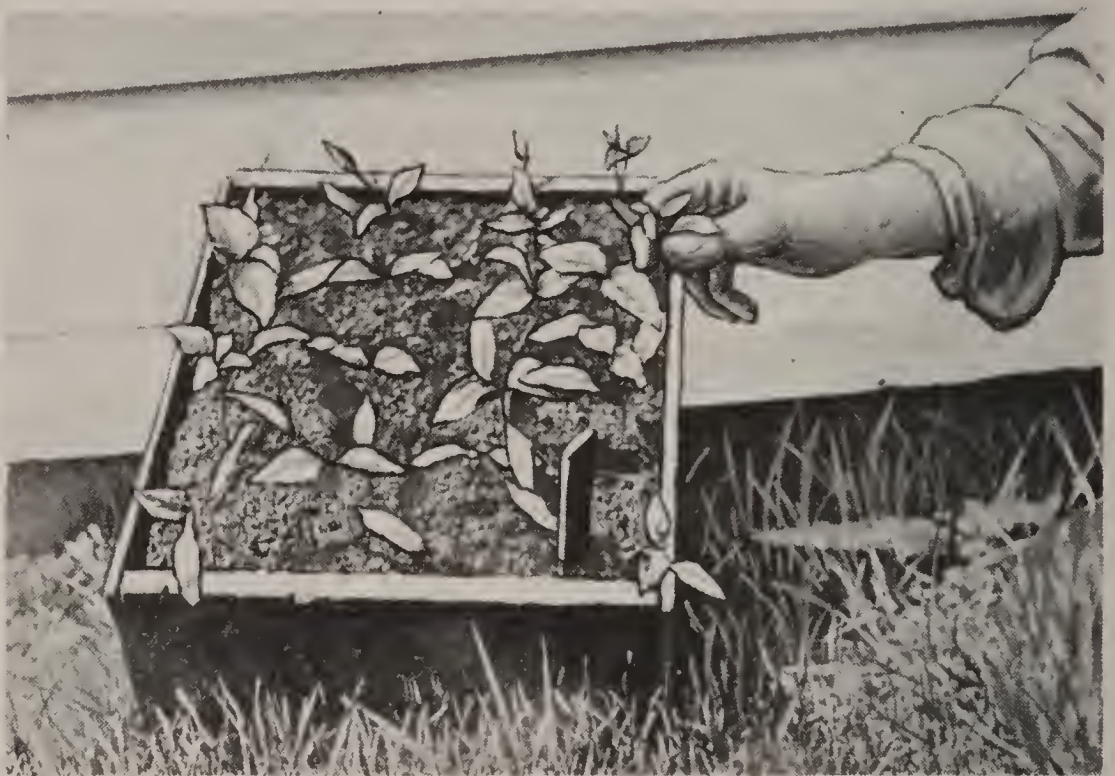
They carried four of the boxes to the barn cellar, uncovered one side of the pile of loam that they had hauled there before winter began, and filled the flats with it. Then they took them to the house, into the kitchen.

Uncle John marked off the earth in the flats in rows, two inches apart. He brought the seeds and Peggy opened one of the packages. She counted out on the table fifty seeds and planted them in the first row, while Uncle John took a little strip of clean wood and wrote on it the name of the vegetable as it was printed on the package. Each package they opened and sampled in the same way, except that when they came to corn and beans and a few others that had large seeds, they counted out only twenty instead of fifty.

When the samples were all planted and watered they made a place for the flats on top of the big woodbox, not far from the kitchen stove.

Uncle John next began to make ready the hot-bed. It would be possible to raise some plants in the kitchen windows, but there would not be space

enough there for more than a small part of the flats that they hoped to prepare. It was a part of their plan to have extra flats to sell in Milford: tomato, cabbage, and lettuce. This meant plenty of room, with warmth to start the plants going and abundant



One of the Flats

opportunity for sunshine. A hotbed was the way to provide this, unless there was a greenhouse to be had, and Apple-top Farm had never possessed a greenhouse.

In the loft of the tool house there were several storm windows that once had been in use on the house but had been discarded.

"We'll fix those up," announced Uncle John.

“They aren’t the same width as regular hotbed sash, but they’ll do for this year anyway. We’ll fix our frame so that they’ll fit.”

He and Jim got them down. There were several broken panes of glass in them. Old Eben, the mail carrier, brought out some new panes from Milford the next day and they repaired the sash.

In the barn cellar Uncle John prepared a pile of fresh horse manure, packing it down and throwing several pails of hot water on it. After a few days he forked it over and packed it down again. It was fermenting and was growing hot.

Meanwhile, he selected some wide boards from a pile under the barn and carried them out to the garden to the pit that he had dug in the fall. There was some snow in the pit. He shoveled this out and lined the pit with the boards. At each corner he nailed a piece of two-by-four. The board walls he carried up, making them twelve inches high above ground along the rear of the pit and six inches high along the front. The end walls he sloped to an even slant from rear to front. The pit had been dug so that the lower part was toward the southeast. When it was all walled up it measured ten feet along the front and back and six feet along the ends.

Uncle John nailed other pieces of two-by-four from the rear wall to the front, spacing them two and a half feet apart. This was the width of the storm windows.

After the pit was ready and when the manure heap in the barn cellar was warm and steaming, Uncle John and Jim set to work with the wheelbarrow and filled the pit up to the level of the ground. Outside they piled more manure against the board walls all around. It took them all of the time that they could manage for it out of two afternoons. They put the sash in place, and the hotbed was nearly ready.

Meanwhile they all watched the flats in the kitchen, where they had planted the seeds to test them. Most of the seeds were coming up nicely. But there were four rows that seemed not to be doing well at all.

"There isn't a single plant of parsnips or of carrots," exclaimed Peggy.

"That's all right," replied Uncle John. "Those seeds are naturally slow to germinate.

"But these other two rows," he continued, "are another story."

He opened his knife and with the blade carefully pushed back the earth along one of the rows and then along the other. A few of the seeds were sprouting. But many gave no signs of life.

"They aren't any good," declared Uncle John. "Both lots of tomato seed are poor. There's something the matter with them."

"What will you do, John?" asked Aunt Emily.

"We'll have to send for more seed. And there



Uncle John Prepared the Hotbeds

isn't time to wait for it, either. We'll want those plants to sell in Milford. Probably there will be more demand for them than for anything else we'll have. It's too bad. But it wouldn't do to plant that seed. I guess it's a good thing we tested it, or we wouldn't have had any plants at all."

"Perhaps Old Eben can get you some seed in Milford."

"It might be, but it isn't likely."

Uncle John wrote a letter at once to a seed house in the nearest city, and gave it to Old Eben that noon. He asked him, also, if he would inquire for tomato seed at Milford. If they had seed of the varieties that he named, Eben was to bring a supply of it and not send the letter to the city.

Old Eben reported the next day. He had not been able to find the right seed in Milford and had sent the letter to the city. The tomatoes would have to wait.

There was no occasion to delay the rest of the planting, however, merely because the tomatoes would be late. The other seeds that were due for starting under glass tested out well enough. So the flats were filled with earth, rows were marked off, and the cabbage, lettuce, and celery were planted. To distribute the seeds evenly Uncle John used an old envelope. He sealed the flap down, cut off the end, placed the seeds inside, and by sifting them out of the end dropped them smoothly into

place. The loam in the boxes had been moderately packed down, firmly but not too hard. When a box was finished Aunt Emily spread a piece of burlap over the top and watered it. The cloth let the water through but prevented it from disturbing the seeds.

Inside the hotbed an inch or two of earth had been spread over the manure. The flats were placed on top of this. It was warm in there. The fermenting manure made plenty of heat. Each morning the sashes were raised an inch or two at the lower end and a block of wood was placed under each one, so that there might be ventilation and in order to keep it from growing too hot inside when the sun was shining on the glass. Each evening the sashes were tightly closed.

Two or three nights when it grew very cold outside Uncle John and Jim spread straw all over the top of the hotbed, holding it in place by boards.

"Some day we'll have straw mats for this," said Uncle John. "We can make them ourselves, just big enough to fit over an ordinary hotbed section. In daytime you roll them up, out of the way."

Aunt Emily had started some of her flower seeds: asters, zinnias, petunias, and several others. The flats containing these she placed in a kitchen window.

A week after they had written for the tomato seed a letter came saying that the dealer was out of

one of the varieties that they had asked for, and inquiring if he might send another instead. Uncle John sent a letter back at once telling him to hurry along the variety that he had. But that caused an-



A Transplanted Flat

other delay. When finally the seed arrived nearly two weeks had passed and the other plants in the hotbed were well up. They started the tomatoes that same day. But it was certain now that they would be late. Worst of all, the hotbed would be

gradually losing its heat and they would miss part of the warmth that the tomatoes otherwise would have had to help on their way.

Uncle John spent an evening or two making more flats, until there were enough to fill all the space in the hotbed and the kitchen windows. Before long the plants that had been started first would be ready to transplant.

In fact it seemed only a few days before the rows in the first flats looked crowded. They made ready the other flats, then, filling them with loam. Uncle John devised a board guide for transplanting, making it just the size of the top of a flat and boring rows of three-quarter inch holes across it. He whittled the end of a stick to a point that could be pushed down through the holes one after another. That made places in regular order to drop the little plants into. The ground was watered until it was moderately moist but not too wet. Then the flats went back into the hotbed, one after the other, each little plant with room enough now to grow.

The tomato seeds had sprouted all right, but the plants were not large enough yet to move to other flats.

"There's no use in trying to hurry them," said Uncle John. "They'll have to take their time."

As spring came and it grew warmer outdoors the hotbed was opened wider during the daytime. The heat from the manure was rapidly dying out.

“That’s the way we want it to be,” Uncle John remarked. “The plants must be hardened off, so that they can stand it to be outdoors without any protection when it comes time to set them out in gardens. We ought to be able to leave the sash clear off pretty soon, except on cold nights.”

But meanwhile other events were taking place at Apple-top Farm.

CHAPTER X

SCRATCH FEED AND DRY MASH

WHILE it was still midwinter Aunt Emily completed arrangements for the baby chicks that were to make up the farm's big flock for the coming season.

It did not take long to decide on the breed of chicks to be ordered.

"We want the breed that will give us the best return all 'round!" Aunt Emily declared. "We want the pullets to lay lots of eggs, and they ought to begin in the fall when prices are going up. The young pullets weigh two pounds when they're eight weeks old. Of course there are several good breeds, but I vote for Rhode Island Reds."

"They'll get broody next winter," prophesied Uncle John.

"Yes, I know, but we'll fix things so as to break that up. Barred Rocks would do the same thing."

So Rhode Island Reds it was.

In February the brooder arrived. Uncle John brought it out from Milford and carried it into the kitchen so that they could unpack it and see how it worked.

“What’s this thing for?” demanded Jim. He was looking at a big flat cone of galvanized iron, fully five feet across. It had come securely fastened in a wooden crate to protect it from danger.



One of the Boxes that the Baby Chicks Came In

“Wait until we’ve set up the stove and you’ll see,” replied Aunt Emily.

The stove itself looked like an ordinary heating stove such as one may see in country stores and offices, except that it was small. It was about two feet high and was made of heavy black iron. In the top was an opening with a lid, where you could put in coal. There was a grate with an arrangement to shake it and beneath that an ash pit with a little door and a small pan to receive the ashes.

A sort of iron arm with a curious contrivance attached to it came with the stove. Uncle John bolted this in place, so that it stuck out to one side of the stove about three or four inches from the floor.

"That's funny," remarked Jim. "What's it for?"

"See this pair of brass disks?" answered Uncle John. "When it gets warm enough near the stove the disks spread apart because of the heat. That pulls on this rod here, and that opens the little door up there so as to check the draft and keep the stove from getting any hotter."

"Look," interrupted Peggy. "You can turn this screw here up or down and that will make the draft open or close sooner, so you can regulate it for any heat that you want."

"That's what we must do, too," said Uncle John. "We'll get the brooder house ready as soon as we can and set up the stove before the little chicks come, so as to have it working right."

"But what's this big thing for?" demanded Jim, pointing to the cone of galvanized iron.

"That's the hover," explained Aunt Emily. "It fits down over the stove and holds the heat."

Uncle John took off the crate from the cone and fitted it in place. The upper part of it had an opening that was just the same size as the top of the stove. The bottom rim was four or five inches from the floor when it was in position.

"The chicks stay under here, don't they?" said Peggy.

"No," said Aunt Emily, "they are not supposed to do that. Under there, they would be crowded too much and wouldn't have enough ventilation. What you try to do is to keep the temperature under this



Four Days Old

hover high enough so that just outside the edge it will be exactly right for the chicks."

"Won't they go under, where it's too hot?"

"If they feel chilly they'll run under for a moment, but as soon as they're warm enough they'll run out again. They'll know enough not to stay where it's too hot. Then, you see, around the outer

edge of this hover there's lots of space for them and they are not so apt to crowd."

The next afternoon Uncle John began on the task of fixing a place for the brooder. In the orchard back of the barn there was a henhouse. The flock of twelve hens that had been purchased in the fall were living there, but it was a much larger building than they needed. One end of this, it was decided, should be given over to the baby chicks.

It would have been better to have a regular brooder house for them, one that was newly built and was planned especially for that purpose. But there was nothing of the kind on the farm, and it seemed best to Uncle John and Aunt Emily not to go to the expense of building a new house the present season.

Across one end of the henhouse Uncle John made a rough partition, dividing it into two rooms. One of these, for the brooder, was about eighteen feet square. The other was a little longer. The hens protested at the noise and confusion, but after a time settled down again.

The front of the brooder room had a single window in it. Uncle John took this out and enlarged the opening, making it three times as big. He fastened wire across this. On the inside he tacked a curtain of burlap that could be raised or lowered. The glass sash that he had taken out he fastened

up outside with hinges at the top so that it could be pulled up.

From the loft of the tool house he brought another sash that had once been in use as a storm window on the farmhouse. This he placed beside the other one. The rest of the opening he left without any means of closing except the burlap curtain inside. It would be necessary to have that much space for fresh air, he said, no matter if it was cold outside.

The brooder stove he set up in the middle of the room. The chimney of the stove he arranged to go straight up through the roof.

Before beginning the work on the partition he had cleaned out the house. Now for the brooder room he wanted a lot of fine gravel to scatter on the floor. But there was none to be had at Apple-top Farm that wasn't covered with snow or frozen up. He had not thought of that before winter came.

Uncle John hitched up Juniper to the wagon and drove to Uncle David's, but there was none there. He finally borrowed a load at the next farm beyond. The wagon held more than was needed for immediate use in the brooder room, so the rest was piled in a corner of the tool room, to be ready for a new coating on the floor, later.

Finally Uncle John and Jim got out the spray pump and filled up the barrel with whitewash. Into this they dumped a can of strong disinfectant that smelled like carbolic acid. With this mixture they

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coated thoroughly the inside of the brooder room, ceiling, walls, floor and all. When it was done they moved the hens over into that part temporarily and gave their quarters a hearty cleaning and spraying. When they moved them back the house looked fresh and clean.



Part of the New Arrivals

About the middle of March a postcard came saying that the baby chicks would be shipped on the twenty-eighth. They ought to arrive at Milford the morning of the twenty-ninth.

On the twenty-second Uncle John started the stove in the brooder room, and Aunt Emily set about adjusting it. In three or four days she had it working in good order, although when a cold snap came

along one night the fire almost burned out. It proved to be necessary to watch the stove rather closely in order to be sure that everything was all right.

At the last minute Uncle John remembered that a little fence of wire screen around the brooder stove would be needed for the first few days, to keep the chicks from wandering too far away from the hover. Jim found the pieces of wire that had been left over from making tree protectors. They fastened these together into a long strip and set it up in a circle a foot or two outside the edge of the hover.

The morning of the twenty-ninth Uncle John hitched up Juniper.

"Can't I go along?" asked Peggy.

"Suppose you and Jim both come," suggested Uncle John.

They drove to Milford and were waiting in the post office when the mail arrived from the morning train.

"I hear 'em!" declared Peggy. There was a muffled "Peep! Peep!" that you could just make out, coming from somewhere back of the partition.

Presently five pasteboard boxes were handed out to them. In the sides of the boxes round holes had been punched.

"Are they all in there?" asked Jim.

"Guess they are," answered Uncle John.

With blankets over the boxes to shield them from wind the chicks were driven to Apple-top Farm. Uncle John carried them at once to the brooder room.

Aunt Emily came hurrying out from the house. She had a pan of sour milk ready. The cover was taken off the first box and Aunt Emily began to lift the chicks out, one by one. Before setting a chick down she dipped its beak in the sour milk and then held it up for a moment, so that it swallowed the drops of milk that clung to its beak.

Before long there was a brown, fuzzy mass of chicks within the wire fence that surrounded the brooder. Some of them remained quiet, huddled together. Others began to run about briskly. Many scratched at the fine gravel on the floor, just as full-grown chickens would do.

Around the enclosure, close inside the fence, Aunt Emily had placed seven or eight small pie pans, each with sour milk in it. Over each pan she had fitted a circular piece of coarse wire screen in such a way that the chicks could drink the milk but were more or less prevented from walking in it. This was the only food that they were given that day. They were hatched with some food they already had supplied to them out of the egg from which they had come. To give them any more for the first day or two would be harmful.

All of the chicks in the boxes were alive when

they reached Apple-top Farm, but not all of them appeared to be well and strong. Several seemed dull and listless as if they were too weak to live many days. By the next morning five of these had died.

"I don't think that's anything out of the ordinary," said Uncle John. "Five out of five hundred isn't many."

For the next few days Aunt Emily and Peggy watched the little chicks a good deal of the time. They gave them a little rolled oats the second day. That was their feed for a while, that and the sour milk that was kept in the pans all the time.

Ten more of the weak chicks died. Three or four would be found each morning. The rest seemed to be doing well. But on the morning of the day that they were seven days old Peggy came running into the house.

"Mamma!" she called, "there are nine chicks dead this morning!"

Aunt Emily went out with her and Uncle John soon followed.

"They've caught some sickness, I'm afraid," declared Aunt Emily. "I don't know what we can do. We've fed them just as we were told to. It must be something that they catch from one another."

In another four days the toll of chicks that had failed to survive reached a total of fifty. Then the

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number that they found each morning rapidly grew less. In a week the loss had stopped. When the trouble was all at an end they had lost sixty-one, or a little over twelve per cent.



Early Eggs Bring High Prices

About that time Uncle John came back from Uncle David's one evening with some news that interested every one.

"The county agent was there," he said, "the man

that the Farm Bureau hires. I told him about our chicks and described how the sick ones acted, and he said that there wasn't much doubt but that they had the disease that is going through so many flocks of young poultry in lots of places. It seemed that it's carried through the egg. Hens have it but they don't show it much."

"It was bad enough in our flock, surely," said Aunt Emily.

"Well, according to the county agent we got off easy. He says that lots of farmers lost last year twenty-five or thirty per cent and some as high as forty or fifty per cent."

"Haven't they any remedy?"

"The right thing to do is to keep it out of your flock. If you know about it you can buy your chicks from people who've had their flocks tested. Then you won't have any of it."

From that time on the chicks grew rapidly and seemed strong and well. They were the earliest hatched chicks of all in that neighborhood. Many farmers, who depended on setting eggs under hens in the old-fashioned way, would not have their flocks started until the warm weather of spring was at hand. Others who relied on incubators disliked the work and risk of very early hatching or failed to make a success of it because they did not know just how to manage the early flock.

As a matter of fact the task wasn't easy, at Apple-

top Farm or anywhere else. Cold weather made it difficult to get the chicks outdoors. Nevertheless, Aunt Emily insisted that they must be outside during the middle of the day as soon as they had passed the critical first period.

Uncle John had arranged a small door on a level with the floor. Outside he built up earth to make an incline to the opening. With some poultry wire he made a temporary fence to keep the chicks close to the brooder house for a few days.

The first few times Aunt Emily drove them out through the small door and shut it to make all of them remain outside. She kept them there only an hour or less at the beginning, but gradually increased the time. Presently the little door was left open all day and was closed only at night.

Soon Uncle John took down the temporary fence and allowed the chicks to range all about. That gave them abundant exercise. They were able to secure plenty of green food, also. There was never any trouble about finding their way back. The only risk was the possibility that a hawk might carry one off. This did occur one day, but something scared the bird away after that and it didn't come back to rob the flock any more.

Occasionally a chick met with an accident or one grew sick. For the most part losses were few after the first three weeks.

Finally, one day when the chicks were six weeks

old, Aunt Emily said that she wanted to count them carefully and see just how many there were. The next morning she and Peggy went into the brooder room before the little door was opened. Peggy arranged a box to cover part of the opening and then raised the door a little, so that the chicks could go through only one at a time. Even with Peggy and Aunt Emily working at the task it was difficult to count them. They crowded tightly around the opening. When the last one had gone through Aunt Emily had counted four hundred and eighteen.

Uncle John came up at that moment.

"Some of those cockerels are getting pretty big," he commented. "I think you'll have some to ship in another two weeks."

"That's what we want," agreed Aunt Emily. "Now's the time, while the price of broilers is high."

CHAPTER XI

A HARVEST FROM TREE TRUNKS

JIM made a discovery.

He was pulling out boards from a pile in the loft of the tool house. It was at the time when Uncle John and he were preparing the partition in the henhouse so as to make a brooder room. In a dark corner of the loft, where the light from the single, cobwebby window could hardly penetrate at all, Jim found beneath the boards what seemed to be a metal trough, like a flat pan several feet long.

"Dad," he called, "come up and see what this is!"

Uncle John joined him and together they dragged the pan out from under the boards and over to the window.

"Well, what do you think of that!" exclaimed Uncle John. "I remember it, just as sure as anything! It belonged to my dad, and we put it up here the spring before we sold the farm. I'll bet it's been here ever since, and nobody ever paid any attention to it."

"But what's it for?" persisted Jim.

"Why, it's a sap pan: for boiling maple sap, to make sirup."

Uncle John stood it up on end in front of the window and looked it over carefully from top to bottom.

“There’s just one place,” he announced. “Down here at this corner there’s a hole. Looks as if the roof of the tool shed had leaked some time and the water had dripped on the pan down here and made it rust.”

“Could we fix it?”

“Sure, we could. ’Twouldn’t take long to solder that place. I wonder, Jim,” he continued, “if the pails are here, too.”

Still farther back in the dark corner Jim found them and rolled them out to the light. There were two lots of them. Each lot included a considerable number, placed one within another.

Uncle John shook them apart and held them up to the window, one after another. A few had rusted out and were not of any value. The others appeared to be all right. They counted them and found that there were about three dozen that could be used.

Jim climbed down through the opening that led to the main floor of the tool house. Uncle Jim handed the pails down to him, one by one. Then they lowered the pan through the opening and laid it on the workbench. It was about six feet long and two and a half feet wide. The sides were low, not more than eight inches high. The bottom was quite

black and shiny. Around the top a heavy wire was set in, to make the pan stiff and substantial.

"You've found it just in time," said Uncle John. "Before long the sap will be running."



Uncle John Bored the Holes

"I'll tell you," he continued, "let's fix up that hole now, before we tell your mother and Peggy what we've found."

Uncle John lighted a gasoline torch and soon had a soldering iron hot. He scraped the pan clean

around the hole. In five minutes the hole was filled and the job was done.

They called Aunt Emily and Peggy and showed them the new possession.

"Where will we get the sap from?" demanded Peggy.

"Why, from maple trees, of course," replied Jim.

"Oh, I know that! But where are all the trees?"

Jim looked at his father.

"Well, they're scattered here and there," said Uncle John. "There are three out in front of the house, you know. Down along the stone wall below the peach orchard there are a few, and there are some more by the wall beyond the hayfield. But the most of them are in the little wood just beyond the pasture across the road. Probably there are forty or more, all told."

They discussed the question of the best location for the sap pan. Since most of the trees to be tapped were in the grove beyond the pasture, it would be an advantage to do the boiling there, in order to save hauling sap. This was especially true because a part of the sap would have to be hauled uphill.

"But we haven't any wood cut down there," said Uncle John. "We did have, but we hauled it all up here. Of course we could take a load or two back. And probably there's some dry, standing stuff that we could cut."

"How about 'tending the fire, though?" suggested

Aunt Emily. "If you set the pan up near the house we can all watch it and take care of it. You know you'll be away at Uncle David's a good deal of the time."

"Probably that's the sensible plan," assented Uncle John. "It just seemed natural to think of doing it down there in the grove; that's all. It was there that we used to do our boiling. But, as you say, it would be better up here this year."

As soon as there was opportunity Uncle John and Jim prepared the place for boiling the sap. There was a brick wall in the cellar under the house. At some time it had been part of a cistern. They took these bricks down, cleaned them off, and wheeled them out to a location beyond the woodpile.

"We'd better not have it too near the house," said Uncle John. "Sparks might blow around and set something afire."

They arranged the bricks in a long, low support for the pan, with room enough underneath to build a fire. One end they left open for feeding in wood. The other end they bricked in, bringing their structure up to a base on which a tin pipe could be fitted for carrying off the smoke. There were lengths of old pipe at Uncle David's that would do. When the pipe was in place they wired it to a post to keep it from blowing down.

From the loft of the tool house they brought down three wide, clean boards. These were intended to



A Corner of the Maple Grove

serve as a cover for the pan when it rained. The rest of the time it would be open, in order that the sap might evaporate more rapidly.

On a low, short sled that had come to them with the farm, they fastened a barrel. The top of the barrel was removed, so that you could readily pour sap into it or dip it out.

The next time Uncle John went to Milford he brought out with him several dozen small, iron spouts. They were about three inches long and as thick as your first finger. They tapered toward one end and near the other there was a short wire hook.

"Now we're all ready for the right weather," announced Uncle John.

"Does it have to be warm?" asked Peggy.

"Warm and cold, both. Frosty and crisp at night, but sort o' warm in the middle of the day. That's what starts the sap flowing. If it turns too warm it won't flow any more."

A few days later Uncle John sent Jim and Peggy early to bed.

"We'll get up early to-morrow morning and tap some of our trees," he promised.

Before it was really light in the morning Uncle John had hitched Juniper to the sled and had loaded the stacks of pails on it. When Jim and Peggy came out he was waiting for them.

"Maybe we'll get fooled," he said, "but I think the sap will start to-day."

They drove to the trees in the woods beyond the pasture. In some places there was snow, while in others the ground was bare. The sled ran easily and silently on the snow. On the bare ground one would think that Juniper would find it hard to drag, but it wasn't heavy and he seemed not to mind.

Uncle John began tapping the trees. He selected a smooth place in the bark and bored a hole two or three inches deep. Into this he drove one of the little iron spouts. From the hook fastened to the spout he hung a pail.

"But there isn't anything running out of the spouts," complained Peggy.

"Wait till it warms up a bit," said her father.

"Look!" said Jim. "Here are some old holes in these trees, just like the ones we're boring."

When they had tapped the largest trees in the grove and had used up most of the pails, Uncle John suggested that they go back to the house for breakfast. He unhitched Juniper and took him back with them, leaving the sled standing in the grove. Jim and Peggy carried the pails that they hadn't yet used, together with the spouts and the brace and bit.

As soon as breakfast was over they tapped the three trees that stood in front of the house and those below the peach orchard. When Uncle John drew the bit out of the hole of these last trees drops

of sap began to run, and as he hung the pail on the hook you could hear the drops falling into it.

Peggy slipped away as they were finishing. In a few minutes she came back, out of breath.

"It's running!" she called. "It's running fast down there in the woods!"

"Looks to me as if I'd have to beg some time off these next few days," laughed Uncle John.

At noon they hauled in the first load, poured it into the pan, and started the fire underneath. Uncle John had to go back at once and bring up more sap. Some of the pails were more than half full, and the barrel wasn't large enough to hold it all in one trip.

"It seems just as thin as water," commented Peggy.

She and Jim brought a dipper from the house and tasted it.

"Why, it doesn't taste much!" she said.

"Wait a little," said Uncle John. "It has to boil down first."

"How much sirup will a barrel of sap make?"

"Only about a gallon or so. We used to reckon about forty gallons of sap to a gallon of sirup."

By evening the liquid in the pan had begun to take on some of the color of sirup, but it still tasted watery. In fact it was only by using your imagination that you could believe it would ever be sirup. On the other hand, the sap had run so briskly that

the big pan was more than half full, and the barrrel was waiting to be emptied.

Uncle John decided that the fire should be kept going briskly through the evening at least. So he got the seat from the wagon, placed it on two pieces of cordwood, and settled himself to tend fire until a late bedtime.

In the morning when they went out and lifted off the boards that Uncle John had laid across the pan when he left it in the night the liquid looked golden brown and gave off a delightful odor. Peggy ran for a cup and a spoon. They all sampled it and found that it was gaining an unmistakable flavor.

At the last minute Uncle John came to the conclusion that they ought to buy new cans to put it in.

"We'll have some to sell," he said. "Unless the sap stops running too soon we ought to have a lot more than we'll need for ourselves. The only right way to do is to put it in nice new cans. Then we can label it and get a good price for it."

He telephoned to Milford and left word for Old Eben to bring out a supply of cans when he came with the mail.

The first thing that morning the barrel had to be emptied, in order to collect the sap from the pails that were already beginning to fill.

"We ought to take out first what's in the pan," said Aunt Emily. "We can put it in kettles and finish boiling it in the house."

So she filled the kettles and two or three pails and began boiling it down on the kitchen stove while Uncle John started the big pan over again.

When Jim and Peggy came back from school in the afternoon Aunt Emily called them to come and look. In two big preserving kettles on the back of the stove was a shining, light brown liquid that you could smell when you first entered the room. Aunt Emily set aside a pitcher of it to have with hot biscuits for supper.

Old Eben had brought the new cans. There were two sizes; some holding a quart and some half a gallon. Aunt Emily had scalded them out with boiling water. "Let's use quart sizes for this," she said.

She filled them, one after another, with the hot sirup. There were fifteen of them when she had finished. Jim and Peggy fitted the corks into place.

"Why, we'll have dozens and dozens of them before we get through!" exclaimed Peggy.

"You can't be sure," replied Aunt Emily. "It isn't always good sap weather like this."

That night after supper Uncle John said that he was going to make the round of the pails because it looked like rain. He started out and brought in all the sap that there was, pouring it all into the pan. Before midnight the rain began. It continued heavily until almost morning. Then the clouds cleared away and when Jim and Peggy came down the sun was shining.

"Let's go around to the pails before breakfast," suggested Uncle John.

"Don't you want Juniper?" asked Jim.

"Never mind now. We'll see," said Uncle John.

They looked in the first pail, on one of the trees in front of the house.

"Why, it's half full already!" exclaimed Peggy.

"But the sap isn't running," said Uncle John.

Peggy looked at him and then at the pail. Uncle John lifted the pail from the hook and held it so that the sunlight shone in it. The liquid in it was grayish in color and there was dirt in the bottom.

"It's just rain water," said Uncle John. "Part of it is what fell into the pail and part ran down the trunk and out over the spout."

He poured it out on the ground.

"Will you have to empty all of them?" asked Peggy.

"I think it's best," replied her father.

Not much sap ran that day or the day following. Then the weather turned more favorable again and for a week they had their hands full. Finally it suddenly turned warm and the buds on the trees seemed about to open.

"That will be about all we'll get this season," remarked Uncle John.

On shelves in the pantry there were four dozen one-quart cans of sirup and two dozen two-quart cans, all filled.

CHAPTER XII

CIONS AND GRAFTING WAX

IN the midst of the busy preparations for spring, Uncle John reminded Jim and Peggy of a promise. But it was a promise that he had made to them, not one that they had given him.

“Remember when we cut off the limbs from those skyscraper apple trees?” he asked. “I spoke of grafting over some of our trees. You wanted to know how grafting was done and I said I’d show you, some time.”

“That was Jim that asked about grafting,” suggested Peggy.

“Well, whichever one of you it was, you were both there, and I said I could show you how it was done more easily than I could tell you. It’s time now to do what I had in mind. To-morrow’s Saturday and you’ll be home from school. I’m going to try to find a chance to do it, some time in the day.”

At noon Saturday when Uncle John came back from the work that he was doing for Uncle David he brought with him a bundle of slender twigs about a foot and a half long.

“Guess I didn’t tell you I had these waiting,” he

remarked. "I cut them last fall from one of Uncle David's trees. They've been wrapped in burlap and stored in his big icehouse, buried under the sawdust."



Cions and Nippers

"Are they for grafting?" asked Peggy.

"Yes, they're cions. These are the twigs that we're going to try to make grow on another tree.

"We must get something else ready," he continued, "and that's grafting wax. I think we'd better start it right now."

From the kitchen cupboard he brought a small bundle that Old Eben had delivered with the mail a few days before. In it were two small packages. One of these, Uncle John said, contained beeswax; the other resin.

The resin he emptied into an old saucepan and melted it carefully over the fire in the kitchen stove. After it had become liquid he added the beeswax and kept the mixture warm until that was melted. He took care, though, not to let it get hot enough to boil.

"We want our tallow, now, too," he said. "If you'll look in the pantry, Peggy, you'll find it on a shelf next to the window. It's just a small package."

This Uncle John dropped into the saucepan, stirring the mixture until all was melted.

"Now we'll pour it out," he announced, "and let it cool, while we eat dinner."

He filled a pan half full with cold water and slowly poured the warm liquid from the saucepan into the water. It didn't mix with the water but remained by itself, gradually hardening.

As they ate dinner Uncle John told them about the bundle of cions.

"They came from a Gravenstein tree at Uncle David's," he said. "It's one of the trees in the orchard where you helped to harvest the apples a year ago last fall."

"I know," interrupted Jim. "They're a striped, red apple. They're good to eat."

"Yes, they are a standard variety of fall apple. So far as I know there isn't any on this place, unless there might be one in the young orchard that isn't



Making the Cleft for Grafting

bearing yet. There's not supposed to be any there, for that is said to be a solid block of Baldwins."

"You remember that sour apple out there in the hayfield," he continued, "the first one that we tackled when we cut off the big limbs? The fruit of that isn't much good. In fact it isn't worth anything

at all to sell. You might get people to take a few of them for cooking, but the price would be low.

“What I want to do is to graft over that tree to Gravenstein. We couldn’t do it all this year, for the tree is too big, even with those limbs cut off. If it was a small tree we could work it over in one season, but a large tree requires two or three years, doing part each season.”

When they had finished dinner Uncle John got the pan containing the grafting wax and took out the mass of wax, squeezing it into a ball. Then he worked it in his hands, pulling it as one would pull taffy, until it had a grainy appearance. Before he did this he greased his hands, so that the wax wouldn’t stick to them.

From another package that Old Eben had brought he took a curious iron tool. It was about twelve inches long and had a wooden handle, like that of a large knife. A part of the iron was widened out so that it looked something like the blade of an ax, except that the blade was longer and not so deep, and it was thin instead of thick. The edge of this was sharp. Beyond that the iron turned at right angles and was shaped like a short wedge.

Uncle John went to the tool house and selected a piece of seasoned hardwood to serve as a mallet. He brought back with him, also, a saw with small teeth.

“Now we’re all ready,” he announced. Carrying

the bundle of cions, the grafting iron, the wax, the saw, and the mallet they walked across the hayfield to the tree that had lost its tall limbs.

"We forgot a ladder, after all," laughed Uncle John. He went to the barn and brought a step-ladder.



Waxing the Stub

"Guess we might as well begin with this branch right here," he said, taking hold of a branch about two inches in diameter, growing at the height of his head.

He sawed it off, square across. Nearer to the

trunk there was a fork, so that the whole limb was made up of three branches, each about the size of the one that was to be grafted.

“We’ll do these others some time,” said Uncle John, “but not this year. One of them will be due next year, and the third one the year following. That’s the way we’ll work with the whole tree.”

He held the sharp edge of the grafting iron against the stub of the branch and struck the iron two or three blows with the mallet. This split the stub down the middle. Then he took the iron out, turned it over, and forced the wedge-shaped part into the split stub, so as to open the cleft. Since the wedge was only an inch or less wide while the branch was considerably wider a space was opened in the cleft on each side of the iron.

The next task was to set a twig from the bundle of cions in each one of these two spaces. If properly set, these two twigs ought to grow.

Uncle John pulled out a twig from the bundle and looked it over. With his pocketknife he cut off the lower part of it, making his cut about an inch and a half below a firm, plump bud. This part of the twig he now trimmed to the shape of a wedge that would just fit nicely into the cleft in the branch that had been split.

He then carefully placed it in position, making sure that the outer margin of the twig was just even

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with the outer edge of the bark on the branch. The bud just above the tapered part pointed outward.



Grafts Well Started

“The thing to watch out for,” he said, “is to have the growing layer of the cion exactly in line with the growing layer of the branch. That’s what is called the cambium layer.”

The tip end of the cion he cut off smoothly, so that the whole length of it was about five inches. Into the other end of the cleft he fitted the other cion. He then removed the grafting iron, allowing the two halves of the split stub to press tightly against the cions.

Next he worked a part of the ball of wax into a slender strip like a ribbon. With this he could cover the bare stub of the branch and the split on each side of it, making the wax thick and solid where the cions projected from the stub.

“That will keep out moisture,” he said, “and anything that might harm the place where they join.”

“But you’ve covered up the buds on the cions right next to the stub,” objected Peggy.

“That won’t matter. If the cion grows the bud will push out through the grafting wax.”

Finally Uncle John pinched off two little round balls of the wax and stuck one on the tip end of each cion.

“Do you put in two cions so as to get a forked branch?” asked Jim.

“No. We want only a single branch. If both cions grow we’ll choose the one that appears to be strongest and cut off the other one close to the stub.”

The whole operation of preparing the stub and placing the cions in position had taken only a short

time—hardly as long, in fact, as it takes to tell about it. Uncle John now selected other branches and treated them the same way until he had grafted a considerable part of the tree. There were still some cions left in the bundle. These he used on a smaller tree near by, another one that was of poor variety.

When he had finished he sat down on a lower step of the ladder and looked at the first tree he had been at work on. It had an odd appearance, with the stubs here and there, and out of each stub two short twigs projecting, like the tines of a fork.

“Did you know,” said Uncle John, “that all the apple trees that you buy have been grafted?”

“It’s a fact,” he continued. “You see, what the nurseryman does is to buy little seedling trees. He cuts these off close to the roots and grafts on a twig of the variety that he wants. The graft isn’t made in exactly the same way as these we’ve been doing, and he uses only one twig to a stock, but the principle is the same.

“He can’t raise the varieties he wants from seeds, you know, because fruit trees can’t be counted on to come true from seed. We were talking about that this winter, weren’t we?

“The seedling roots furnish food and water for the cion. After a year or two you wouldn’t notice that the tree had been grafted unless you looked closely at the stem next to the roots. There may be a little crook in it at that place.”

"Are all kinds of fruit trees grafted?" asked Peggy.

"Some of them are, and some are budded. They usually bud peaches and plums and cherries."



Apple Seedling that Has Been Grafted

Uncle John cut off a small section, about an inch in diameter, from one of the branches that he had sawed from the apple tree.

"Suppose this is the stub of the seedling that we are going to bud," he suggested.

With the blade of his pocketknife he made a cut lengthwise in the bark and another across the upper

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end of it, so that the two cuts looked like a capital T.

“Now we’ll call this the bud-stick,” he continued, picking up a discarded part of a cion.

Starting his knife just above one of the buds on the cion he slipped the blade down and then out, thus cutting off the bud and a little oval piece of bark and wood with it.

With the point of his knife he loosened the bark alongside the T-shaped cut. Then he carefully inserted the bud into this space, with the bit of bark to which the bud was attached under the bark flaps of the T.

“Next we’d need to wrap it,” he said, “so as to hold it in position for two or three weeks until the bud and the stock have begun to grow together. The nurseryman wraps it with raffia. That’s made of strips from a kind of palm. After two or three weeks he has to go ’round and cut off the wrapping, because if he didn’t the bud and stock wouldn’t be able to grow properly.

“I’ve never seen them do all the different kinds of plant propagation,” continued Uncle John, “but I know that there are a good many different ways.

“For instance, take bushes that grow in a clump. Sometimes they heap earth in a mound around the base of the clump. That makes the bush throw out a good many new shoots at the base. After these shoots are well started the earth is removed. Then

the clump can be divided into a number of separate bushes.

“Another way is a method that’s spoken of as layering. A shoot is fastened down near the ground and some earth is piled on it at the joints. Roots will start at those places and a new shoot spring up



Layering

Then the part that connected it to the old plant is cut off.”

“Isn’t that the way that mamma said that strawberry plants spread, by themselves?” asked Peggy.

“It’s nearly the same. The tip of a runner from the strawberry plant bends over to the ground and takes root of its own accord. Then all that the grower needs to do is to cut off the runner, take

up the new plant and set it out wherever he wants it. There is one kind of raspberry that does the same thing. The cane bends over until the tip touches the ground. Then it takes root there.

“With some plants the runner goes underground. It’s called a root stalk. It keeps growing longer and longer, and every once in a while it sends up shoots above ground and forms roots. Some of our worst weeds spread that way. If you plow the ground where they are you just break these up into separate plants, and each one will continue to grow and spread. You have to use some means to haul them all out on top of the ground so that they will dry out and die. You see, nature has good means of making plants grow and increase in number.”

“When we plant potatoes, is that plant propagation?” asked Peggy.

“Yes. A potato is really food supply that the plant has stored up to take care of new plants. Each eye in the potato is a bud that might grow to be a plant, using the substance of the potato to live on until it had roots of its own. Bulbs, too, are stored food, that the plant would use. That’s what onions are. Grain, such as corn or wheat, is largely food that the plant has made ready. We find it already stored and we use it for our own food supply.”

“We rob the plant, then, don’t we?” speculated Peggy.

“Well, we make use of it. But we save a lot of

the seed and sow it in fields that we have prepared for it. Perhaps there are more of the plants in the end than there would have been if we didn't do that.

"Often, too," he continued, "we propagate in ways that the plant itself couldn't follow. You know there are many plants that you can multiply by simple cuttings. If you prepare a moist, suitable place for them to start in you can take a small piece of the stem, plant it, and presently roots will form at the lower end and a new top will form. That's the plan that is followed in multiplying some of our flowering plants.

"The plant couldn't do that very well—could it—any more than it could do grafting or budding," laughed Uncle John.

"In fact," he continued thoughtfully, "the whole plant world is a good deal different from what it would be if plant breeders and propagators hadn't been at work. It is more beautiful and more useful. Of course there were useful and beautiful plants to start with. But probably many of them would still be so rare that no one would ever know of them. All of our orchards and gardens and our fields of grain are made possible by plant propagation."

CHAPTER XIII

THE SPRAY PUMP AT WORK

“JIM,” said Uncle John, “we must get the spray pump ready.”

Already the spring duties at Apple-top Farm were growing so numerous that the time seemed crowded. There were no longer any days when you could choose what you'd like to do. The work itself did the choosing for you. Each morning there were definite things to be done, and they were the kind of tasks that couldn't wait until some other day.

The chicks in the brooder house must be fed and watered and the stove kept working properly. The plants in the hotbed and those in the kitchen windows required regular attention to make sure that they were not suffering from too much or too little moisture and that they had the right amount of heat or ventilation. The maple trees had already yielded their harvest.

And now Uncle John announced that it was time to fix up the spray pump!

“Why do you spray now, daddy?” asked Peggy. “There aren't any leaves on the trees yet, and we haven't any garden planted.”

"It's the fruit trees that we need to attend to," said Uncle John.

"There aren't any bugs now, are there?" asked Peggy.

"There are always bugs," laughed her father. "Of course it's true that you don't find them doing much damage until later, when the leaves are out, or after the fruit has come. That's when we'll really have our round with them. They'll know when our garden is planted, all right.

"But there are insects in an orchard in winter as well as in summer. There are some kinds that we can kill easily by spraying now before the leaves are out that we couldn't kill at all, or not very well, a little later.

"Besides that, there are diseases of fruit trees that are best fought by sprays that are applied before the buds open. The county agent that I talked with at Uncle David's told me to apply the dormant spray even if I didn't do any other. That's what they call the earliest spray, because the trees are still dormant. They haven't put out their leaves."

"How can you manage it, John, without any help?" asked Aunt Emily.

"I can't. But Andy Wiggin is going to begin work soon at Uncle David's, and meanwhile he's promised to come up here and work with me for two or three days until we get this job done."

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"I went and looked at the little trees," said Jim. "The rabbits and mice didn't gnaw them any. Guess our tree protectors kept them away. But they gnawed two or three of the other trees in places. Just a little. Not enough to hurt them much."



Applying the Dormant Spray

"Then it's a good thing we put wire around the small ones," suggested Uncle John. "A rabbit wouldn't have to do much gnawing on one of those little ones to finish it."

Friday afternoon when Jim came home from

school his father had the spray pump pulled out into the middle of the barn floor and was taking it apart.

“It’s bound to need some new packing,” he said, “after standing there all winter.”

But it was more than new packing that the outfit needed, as they found when they had removed the parts. A valve was broken. Probably it had been so for a long time. There was no possibility of using the pump until a new valve had been secured. The pump could not force any liquid out unless it had sound valves in working order.

Uncle John telephoned to the dealer at Milford to ask him to send out a new part by Old Eben the next day. But he found that this was an old style pump and was no longer carried in stock. It would be necessary to send to the factory for a new valve.

There was no help for it. The delay was unfortunate. The peach trees were already at the stage when the spray could not be delayed. The plum and cherry trees were not far behind.

If the weather should happen to be cold, so that the apple trees did not develop rapidly and if the new valve arrived promptly, the spraying of those trees could be done in time. But if it was too long delayed or if warm weather made the buds open, the opportunity would be lost and it might be that the apple crop would suffer.

“It’s a good lesson,” said Uncle John. “I ought

to have looked that pump over weeks ago and made sure that it was all right."

The few days that followed were anxious ones. For a day or two it was warm. Then it turned cold again and the trees were at a standstill. Each day Old Eben reported that the new part had not arrived yet. Uncle John thought of buying an entire new outfit, but that meant spending a considerable sum, and the dealer in Milford felt sure that he would hear from the factory before long.

At last it grew much warmer. The peach trees had passed any possibility of the dormant spray. It happened that not many of them were going to bear fruit. There seemed to be some condition that made them do poorly. The buds on the cherry and the plum trees had burst.

But it was the apple crop that counted for most. On those the buds had not opened, but they showed wide margins of green.

Finally, one day, the new valve arrived. It seemed as if even the apple trees were too far advanced to receive a dormant spray. Uncle John was in grave doubt what to do.

He called the county agent on the telephone and asked his advice. The agent said that in many places the growth was too far advanced to make it safe to spray. He asked Uncle John to describe the condition of the trees, and then, on second thought,

offered to drive to Apple-top Farm, the first thing in the morning, and look at the trees, himself.

Uncle John walked down to Uncle David's after supper and arranged with Andy Wiggin to be on hand the next day. It would be Saturday, so Jim and Peggy would be there, too.



San José Scale as It Appears Through a Lens

Before breakfast the next morning Uncle John and Jim got out the spray material.

"Maybe we won't be able to use it this time," said Uncle John, "but we'll have it ready."

The liquid for the spray was in a small barrel. It was labeled "Lime-sulphur" and there were printed directions telling how much to dilute it with water

for dormant spraying and how much for use on trees in leaf.

"If we can't put on the strong spray maybe we can put on the weak one," suggested Jim.

"Yes, but it wouldn't serve the same purpose," replied his father.

They turned the barrel on its side, rolled it up an incline made of two planks, and got it into position on a strong box, to serve as platform. Uncle John fitted a spigot into it, so that the liquid could be drawn off, as needed.

"Let's fill up the tank," said Uncle John.

They measured out five gallons of the liquid and poured it into the barrel of the sprayer. The rest of the space in the barrel they filled up with water. Then they tried a few strokes of the pump, to see if it worked all right. Everything seemed to be in good order.

"All we need is to be told to go ahead," laughed Uncle John.

Before breakfast was over Andy Wiggin came. Within half an hour afterwards the county agent drove into the yard in his car. The men walked out to the young orchard and back through the trees at the rear of the barn. When they came back the county agent looked at the sprayer and then at Uncle John and shook his head.

"I don't know what to advise you," he declared. "The trees are farther along than they ought to be

for a dormant spray. There's a good deal of green showing and it will be burned by the spray material. On the other hand you ought by all means to have this application to control scab. It's been bad in this section for the last two or three years, and it's likely to be the same this year. You can't tell. It's possible that it might not show up much, especially if it's a dry season, but the chances are that it will be on hand. Besides that, there's some scale."

"Is there anything that we can do later?" asked Uncle John.

"You can do something to help hold the scab in check by a later spray, but this first application is the most important step. The others just follow it up and continue the protection. For the scale this is the only spray that amounts to anything."

"Would it hurt the trees badly to put the spray on?"

"I wouldn't say that it would do them permanent harm. It's this year's growth that might be injured. It might hurt it a good deal and it might be all right. It's a guess."

Uncle John turned to Andy Wiggin.

"Hitch up Juniper!" he said. "We're going to spray!"

In ten minutes the outfit was at work, Andy Wiggin doing the pumping and driving while Uncle John held the nozzle and directed the mistlike spray so

as to coat every inch of surface of twig, branch, and trunk. There were about twenty feet of hose attached to the pump and thus Uncle John could walk about beneath a tree and send the spray up into it from points of advantage.



Plums Injured by Rot

The county agent was talking with Jim and Peggy.

“Do you know what scale looks like?” he asked.

They shook their heads.

“Well, come with me and I’ll show you.”

He walked with them to the orchard back of the barn, stopped beneath one of the trees, and pulled down a branch so that they could look at it closely.

"There it is," he said, pointing to a section of bark.

"Just those little things that look like gray specks?" asked Peggy.

"Yes, that's it."

"I shouldn't think that those could hurt a tree much."

"It doesn't seem so. But they can. If they are allowed to multiply without anything to check them it won't be long before there are millions of them all over the bark and twigs and even the leaves and fruit.

"You see," he continued, "the specks are really little wax coverings. Under each one is a living insect."

"Is it under there now?"

"Yes, it's there all winter. Each one of those insects has a slender beak that it pushes down into the growing bark and in that way it sucks the sap. By spraying now with lime-sulphur at winter strength we can kill the scales. If we waited until the leaves were out we couldn't use the spray material strong enough, because if we did we'd kill all the leaves. Besides, when a tree is out in leaf you can't be sure of coating all the twigs and branches because the leaves are in the way."

"What's lime-sulphur made of?" asked Jim.

"Just sulphur and lump lime and water, boiled together in the right proportions. Some growers make it themselves. There are some that boil the materials in a big iron kettle, but a better way is to boil with steam. They run steam into a barrel or tank. But unless you have good arrangements for making the spray, it's just as well to buy it already prepared. When a man has a big orchard it pays him to have his own plant for making some of the sprays he needs."

"What was that other thing," asked Peggy, "that you told daddy he ought to spray for now?"

"The scab?"

"Yes, that was it."

"That's a disease: what we speak of as a fungous disease."

"Can we see it?"

"That would be pretty difficult just now. It is present around the opening buds and probably in the growing tissue of young twigs, but it would require a microscope to make it out. Later, you can see its work easily enough. It makes brown spots on the leaves. Sometimes a great many of the leaves will drop off. But the worst damage that it does is the injury to the fruit. It causes a thick, dark place in the skin. Where the fruit is badly attacked the apples are not much good. It causes a great deal of loss."

They walked along together through the orchard. The visitor stopped and put his hand on a rough, dark scar in the crotch of one of the trees where the main limbs branched.



Canker Sometimes Kills Trees

“That’s canker,” he said. “It’s caused by a disease, too. In fact there are several different kinds.”

“They’ll be spraying over here after a while,” said Peggy, “and then they’ll stop all these things that hurt the trees.”

"It would be good if they could do just that," said the agent, "but I'm afraid it isn't possible."

"You see," he explained, "there are a good many diseases that spraying will check. But there are others that we don't know how to control; not by any sprays that have been invented so far. Often a disease works entirely inside a plant and doesn't come to the surface except once in a long while when it forms spores—something like seeds but very, very small. In that case it's hard to see how a spray can do any good except as it's applied when the spores are being formed, in order to kill them and prevent them from spreading the disease to other plants."

"Well, I hope daddy kills the scale and the scab," said Peggy.

"I hope so, too," agreed the visitor. "And I hope that the spray won't do too much harm."

Two or three days after the spraying was finished Andy and Uncle John walked out to the orchard behind the barn and looked at some of the trees.

They could see plainly the effects of the spray. The margins of the opening buds where the tender green had been visible were now brown and shriveled.

"Looks to me as if it's hurt them pretty bad," said Andy.

"Yes," said Uncle John slowly, "the spray has burned them. There's no doubt about that."

They walked on across the hollow to the young

orchard. Everywhere it was the same. The buds that should by now have wide margins of green had borders of brown instead.

“The question is,” remarked Uncle John, “whether the heart of the bud has been injured. A few days will answer that.”

Another week furnished the beginnings of an answer and a second week made it positive. After a brief period the expanding buds began to show new green. The clusters of leaves spread open, still with ragged edges and traces of brown on their margins, but with ample green surface. They had not been killed.

The final part of the answer came before long. Everywhere, except on the little trees, blossom buds began to burst open. Presently each apple tree wore a robe of white. From far and near bees came to visit the blossoms.

The trees had come through all right.

CHAPTER XIV

SEED BED AND SHIPPING CRATE

By the time the spraying of the fruit trees had been finished the brooder house was ready to yield its first returns.

For several days Aunt Emily had been speculating as to the weight of the largest of the cockerels in the flock of young chickens. She felt positive, she said, that some of them would reach two pounds. They had long, strong legs and their bodies were of good size. Their combs were developing. So were their voices.

Uncle John drove to Milford and brought back a number of shipping crates. They were made of thin, tough boards and narrow slats, securely fastened together and bound with wire. There was a small door in the top of each one.

"Let's weigh some of the largest ones," proposed Aunt Emily when Uncle John came into the house that evening.

There were spring scales in the kitchen. Uncle John got a lantern, Jim carried the scales, and they all went out to the brooder house. The chickens had already gone to roost, but as Aunt Emily opened

the door and the light of the lantern shone in some of them stirred uneasily and one or two hopped down to the floor.



Preparing to Plant the Garden

Aunt Emily walked quietly to the roosts and carefully picked up one of the cockerels while Uncle John held the light so that she could see. She carried him to the scales and after several trials persuaded him

to remain quiet. Sure enough he weighed two pounds and two ounces.

"There are a good many that are bigger than that one, I'm sure," declared Aunt Emily.

They tried three or four more and found one that brought the scales down to almost two pounds and a half.

"We can't ship any to-morrow," said Aunt Emily. "It's Saturday, and they'd arrive at the wrong time. But we could send off a crate or two Monday, if we can manage to get them to Milford."

"I could drive in early Monday morning," proposed Uncle John.

When they went back to the house Aunt Emily and Uncle John discussed the question of market. The farmers in the neighborhood usually sold their chickens to a dealer in Milford or shipped them to a city about fifty miles away. But the market reports in the newspaper showed much higher prices at a larger city three hundred miles distant.

Aunt Emily had asked the county agricultural agent about this, when he visited Apple-top Farm a few days before. She had secured from him the name of a dealer in the larger place that he considered to be reliable. The express charges to the more distant point were considerably greater, but the difference in price more than made up for the added cost of shipping.

"Of course they'll shrink more in the longer trip," commented Aunt Emily.

"That's funny," remarked Peggy. "What makes them shrink?"

"They always weigh less when they get to the end of their journey," said Aunt Emily. "They don't eat much on the way. And then the strange surroundings and the noise must bother them.

"But, even allowing for shrinkage," she concluded, "it seems as if we'd receive more for them by sending them to the high-priced market. We'll try it, anyway."

"If there are many large ones," suggested Uncle John, "we'd better make a good-sized shipment. The market's high now. It's likely to drop after a little, with other folks getting ready before long to send in broilers. Ours are extra early and we ought to get the top price."

When Monday morning came they had four crates ready to ship. Aunt Emily was confident that there wasn't a cockerel in the lot that weighed less than two pounds. At noon Uncle John came back from Milford and reported the weights as they had come out when the crates were placed on the scales at the express office. Allowing for the crates themselves the broilers had averaged two pounds and three ounces each.

"We ought to hear from the dealer by Thursday," said Aunt Emily. "That will be our first real sale

from Apple-top Farm, not counting the apple crop last fall. Those apples, of course, we didn't really raise ourselves."

"There will be more sales pretty soon," said Uncle John. "Maple sirup, for one thing. We might take some of that to Milford and see what the store will give for it. And the plants in the hotbed are going to be ready as soon as folks start their gardens."

The report from the shipment of broilers arrived Friday. It was a good return. After counting out express charges and the dealer's commission the price received was a little over seventy cents a pound. That gave a return of more than a dollar and forty cents apiece.

"To think of a price like that for those small chickens!" exclaimed Uncle John.

"That's all right!" said Aunt Emily. "They're extra early and they ought to bring a good price!"

They had already shipped two more crates on Thursday, and they decided to make still another shipment the following Monday.

"Now's the time," said Aunt Emily. "We'd better sell all of them as rapidly as we can."

"Aren't we going to save any to eat?" demanded Jim.

"Well, I've been thinking that, too," commented Uncle John.

"You can save out a dozen," decided Aunt Emily.

"We can let them grow for a while and have them in the summer and fall."

"Why don't we let those grow that we're sending away?" suggested Peggy.

"They wouldn't bring as much real profit," explained her mother. "For one thing, the price will



Planting

be dropping after a time. We'd have to reckon on that. Besides, it takes more than twice as much grain to raise a broiler to a weight of three pounds as it does to bring it to two pounds. The older and larger they are the more feed it takes to make a pound of grain in weight. So the most profit lies in selling them early.

"You see," she added, "on most farms they don't try to have the chicks so early, and they haven't any broilers for the early market. That's what makes the price high."

"Well," remarked Uncle John, "I don't know whether our hotbed and garden can equal your chickens or not."

Each day, now, Uncle John was watching the ground in the garden to be ready to plow it as soon as it was dry enough. It was a good location for early planting. The soil was somewhat sandy and the slope of the land was toward the southeast, so that all the warmth of the sun helped to dry it out. Twice it rained just when the plot was ready to work, and the job of plowing had to be postponed.

Uncle John was no longer working for Uncle David. Apple-top Farm had enough on hand, now, to keep one man busy. In fact there was more than one man could do, and Uncle John arranged with Uncle David to secure the services of Andy Wiggin a part of the time each week until the rush was over.

Finally there came several warm, sunny days, and the garden was plowed. Three or four loads of old manure were hauled out from the barn and spread over it. Then it was harrowed with the new disk harrow, back and forth, lengthwise and crosswise, until the ground was mellow and fine.

"We ought to have a smoothing harrow to level

it off with," remarked Uncle John, "but we'll manage without it this year."

Andy Wiggin and Uncle John picked out a piece for the potatoes, a section just beyond the peach orchard.

"I may want to extend that orchard another year," said Uncle John, "and it won't hurt the ground to be under cultivation."

Andy started plowing this piece while Uncle John made ready to plant the garden. By the time he had brought out the seeds, Jim and Peggy came back from school and joined him.

Uncle John had with him the rough plan of the garden that he had drawn when they were ordering seeds. He had a length of stout cord, also, with a stake attached at one end and the rest of the cord wrapped around the middle of another stake.

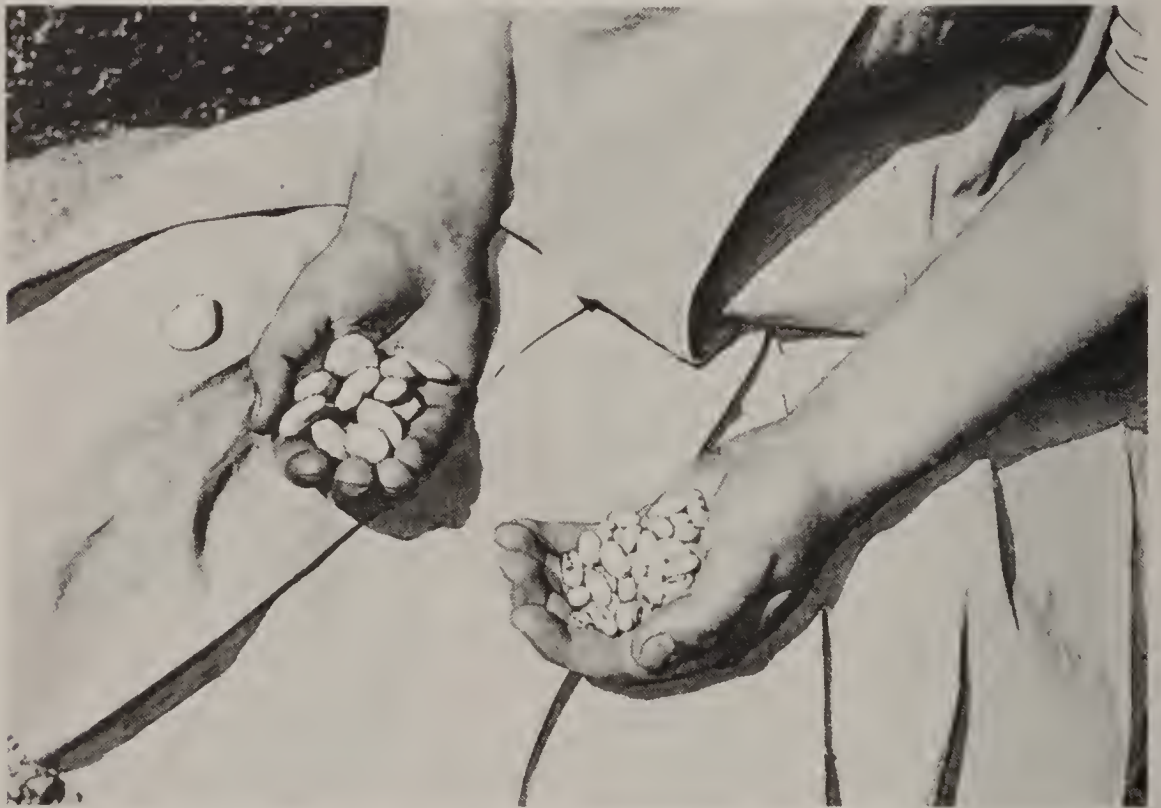
Beginning at the part of the garden nearest the fence that adjoined the grassy yard he set up one of the stakes at the edge of the plowed land and unreeled the cord until it reached halfway across the piece.

"We'll have a space down the middle here," he said, "where we can walk."

"You know," he added, "if we didn't have so much work ahead for Juniper to do right now we could use him in running some of our furrows for us. In that case we'd run our rows the long way of the piece. But June has all he can do, with the potatoes, and the peach trees, and the young apple orchard."

In the wheelbarrow Uncle John had brought out an iron rake, a spade, a hand trowel, and two hoes, a wide one and a narrow one. With the narrow hoe he made a shallow trench alongside the cord.

"We'll start with the peas," he said. "You youngsters know how to plant them. I'll open up



Two Kinds of Bean Seeds

the trenches for them, and you plant the seed and cover it."

He moved the cord to a new location about two feet from the first one, and made a second trench, while Jim and Peggy dropped the seeds into the furrow and covered them with the iron rake. Before long they had a dozen rows planted.

Next they planted several rows of beets and carrots, and a row of parsnips. With the carrot and parsnip Uncle John mixed a few seeds of radish.

"Those are for markers," he said. "They'll come up soon and show us where the rows are. The seeds that they're mixed with are always slow."

"I know," said Peggy. "When we tested them I thought that they weren't any good."

Beyond the parsnips they planted lettuce and radishes, and then onion seeds. By that time it was so dark that they couldn't see to work any longer.

Andy Wiggin came up with Juniper.

"I made a good start on your potato field," he remarked. "Maybe I can finish it to-morrow."

"Going to harrow it right away?" he went on.

"Just as soon as we get it plowed," replied Uncle John.

"Are you figuring on using that small harrow?" persisted Andy.

"That's all I have."

"Well, now, Mr. Harlow," suggested Andy, "if we could get at that piece with a regular two-horse harrow we'd gain a lot of time. I can get a harrow from Mr. North, because he said so. I've got my own horse, and I can bring him along. I won't make any big charge for him."

Uncle John thought it over.

"All right, Andy," he said. "We'll do it that way."

The next morning Uncle John was at work in the garden again. Jim and Peggy joined him for an hour, but had to leave to go to school.

Before they left they helped to transplant half a dozen flats of lettuce from the hotbed.

"These will give us some extra early heads," remarked Uncle John. "Perhaps we'll have some to sell."

When the children had gone he prepared to set out celery plants from the hotbed. Andy Wiggin came up with Juniper and ran a furrow down the length of the garden in the half that had not yet been planted. In this furrow Uncle John set out several flats of slender, feathery celery plants.

Then he walked down and talked with Andy.

"What would you think of taking a chance on a row of beans and a little corn?" he asked.

Andy shook his head.

"Likely to get frosted," he commented. "They're too tender."

"Yes, I know, but there's a chance that they might get through. If they do, I'll have early stuff to sell while the market is high. If they don't, I've lost only a little seed and my time."

"Well, on that score you might try it."

So one long row of beans and another of sweet corn were added to the garden. Six flats of cabbage plants from the hotbed made still another row.

Uncle John had to stop then to look after the duties about the farm.

By evening Andy had finished plowing and harrowing the potato piece.



Cutting Seed Potatoes

“Going to plant right away, Mr. Harlow?” he asked.

“Just as soon as we get our seed ready,” said Uncle John. “I’ve already treated it for scab, and we’ll begin cutting to-morrow morning.”

“Got some good seed?” asked Andy.

“I think so. It’s some of the certified seed that

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the county agent told about. I want to dodge the blight if I can."

Another day of bright weather favored the garden-making. Andy and Uncle John began cut-



Garden Tools

ting up seed potatoes as soon as breakfast was over. Each sat with a pail on the ground between his knees and dropped the pieces of potatoes into it. They cut them so as to have two or three eyes to each piece.

When they had several sackfuls ready Andy took Juniper and opened a number of furrows the length of the potato patch. Uncle John walked along with a pail in one hand, dropping the seed potatoes into the furrow, spacing them twelve to fifteen inches apart.

Andy had brought out a sack of commercial fertilizer from the barn. He opened this, filled up a pail, and followed Uncle John, scattering a handful of the fertilizer near each seed potato but taking care not to drop it directly on the seed.

After that he drove Juniper and the plow along the rows between the furrows, throwing the earth back into the trenches and covering the potatoes.

When they had planted all that they had cut up they tied Juniper to a fence post and prepared more seed. By the time Jim and Peggy came home that afternoon the patch was almost finished.

Uncle John stopped at the hotbed as they walked toward the house.

"It's time we sold some of our plants," he said.

He turned to Andy. "Do you suppose people down Milford way are ready to set out plants yet?" he asked.

Andy shook his head. "Not many of them yet," he said. "Only a few gardens are as early as this one, Mr. Harlow. But there are some that would be ready. And other folks like to buy flats beforehand, even when their ground isn't ready."

"I think I'll go to Milford with some of them tomorrow," said Uncle John.

CHAPTER XV

THE EARLY GARDEN

UNCLE JOHN started for Milford early the next morning. Aunt Emily got up at daybreak and prepared an early breakfast for him while he did the chores and loaded the wagon.

The body of the wagon he filled with flats from the hotbed: early plants that could be set out in gardens before danger of late frosts was over. There were cabbage plants, lettuce and celery. Toward the front of the wagon Aunt Emily had placed six flats of small, hardy flowering plants.

"I don't know whether you'll find a sale for these or not," she remarked, "but I want to send in a few. Perhaps if people know about them they'll buy some."

"For that matter," said Uncle John, "I don't know what the demand will be for the vegetable plants. Perhaps it would have been better to telephone to Milford before taking them in."

"But then," he added, "it isn't the sale of young plants that we count on most, anyway. They are just that much to be gained, if we can find a market. Most of our young plants we want to set out our-

selves, in our own garden, so as to sell folks the vegetables after the plants are full grown."

"I don't know about my flowers," said Aunt Emily. "If we should find that city people begin to come out here in autos I think that I can sell lots of cut flowers."



Shade for Transplanted Tomatoes

"That would be true of our garden stuff and our fruit, too," remarked Uncle John.

Before he started for Milford Aunt Emily suggested that he take with him a few cans of maple sirup.

"The stores ought to buy some of it," she said.

So they brought out twelve cans, six of them of the quart size and six of the two-quart size, and packed them under the seat of the wagon.

"What price shall I ask for them?" asked Uncle John.

"For the maple sirup?"

"Yes, and the other things, too."

"I don't know. You'll have to see what the stores will give you."

When Uncle John came back from Milford about the middle of the afternoon he had an interesting story to tell. As he drove into town a man who passed him at a corner stopped him and asked if the plants were for sale. Uncle John said that they were. The man explained that it was the flowers that he was interested in and asked if Uncle John would turn back a block to their house. He did so, and sold all of the flowers there at fifty cents for each flat. This was the price, the man said, that the stores were charging.

While they were talking a neighbor came across the street and joined them. He was interested in vegetables and bought two flats each of lettuce and celery and four flats of cabbage, paying the same price that the other man had paid for flowers.

The rest of the vegetables Uncle John disposed of at two stores, receiving thirty cents for each flat. They were not very ready to buy, and said that it

was a little too early to sell the plants easily. Most people had not yet had their gardens plowed. In fact, in most places the ground wasn't fit to work. It would be another week before it was ready.



The First Onions

The maple sirup was easily sold to the first store that Uncle John called on, the quart size bringing seventy-five cents each and the two-quart size a dollar and a half each.

The total sales for the trip amounted to twenty-six dollars and fifty cents, including three dollars for Aunt Emily's plants.

"But it isn't so much to-day's sales that pleases me," remarked Uncle John, "as it is the fact that the gardens down there are not ready to plant yet. It seems to me that our land out here is 'way ahead of theirs."

"It's higher ground, for one thing," suggested Aunt Emily.

"Yes, that would make it freer from frosts. But it's the kind of ground, too. I don't think that I ever noticed it especially before, but the ground down there around Milford is pretty heavy and wet as compared with ours. It would be slower to dry out and warm up.

"It seems to me that we'd do well not to sell many more plants from our hotbed, but plant them in our own garden and have vegetables ahead of those that people might be raising down there. We can easily have early vegetables two weeks sooner than they can.

"There's just one thing," he added thoughtfully. "If there should be a drouth we'd suffer up here because our land is sandy. That may be something to reckon with."

Another problem to reckon with made its first appearance the next morning. Insect pests began their work in the garden.

When Uncle John went out after breakfast he found eight of the cabbage plants that had been set out lying on their sides and wilted. They had

been cut off quite near to the ground. A short stub of the stalk just showed above the surface.

Pulling the earth away from around the stub of a stalk Uncle John found a brownish worm curled up underneath the surface of the ground. He went on



Early Radishes

to the next plant that had been cut off and found another worm.

Jim joined him while he was searching.

"They're cutworms, aren't they?" he said. "Andy showed them to me last year at Uncle David's."

"We ought to have scattered poison bait for them," said his father, "before we set out these plants."

"Can you kill them that way?"

"Yes, that's what they say. Let's do it now," he continued, "before we set out any more plants and before our seeds come up."

They went to the barn, got out half a sack of bran, and carried it into the tool house. Jim found an empty box and they poured the bran into it. Next Uncle John sprinkled onto the bran a part of a pound box of Paris green. They mixed the bran and the Paris green together thoroughly.

Uncle John went into the house and came out with a pail of water and a jug of molasses. He poured a part of the molasses into the water and stirred it up. Then he slowly added the mixture of water and molasses to the bran in the box, stirring it with a stick.

"Now there," he said, "we'll scatter this over the ground in the garden for the cutworms to feed on. The molasses and bran attract them and the Paris green kills them."

He picked up the box, but stopped and set it down again.

"This isn't the right time of day to scatter the bait," he laughed. "Cutworms come out at night. If we put out the bait now the sun will dry it all out before evening. We'll have to wait."

They covered the box with newspaper and boards, to keep the bait moist, and walked back to the garden.

“I’m going to set out more plants, anyway,” declared Uncle John. “We’ll scatter plenty of bait around them this evening.”

The next day three or four more plants had been cut off. But after that there was no more trouble from cutworms.

As the days passed the garden grew rapidly. Presently Uncle John planted several long rows of sweet corn and several more of beans. He made a second planting of peas and additional sowings of beets, lettuce, and radishes.

The manure that had come from the henhouse was mixed with soil in hills for squashes and cucumbers, so that they might have an abundance of rich plant food.

The tomato plants in the hotbeds were at last ready to set out. There were not many of them. When the seed had been so long delayed they had decided not to start very many flats. As a matter of fact the plants would have been in ample time for sale to stores in Milford, because gardens down there were so much later. They could easily have sold a hundred flats or more. But they had only a few besides what they needed for themselves—not enough to make it worth while to drive to Milford for these alone.

“We’ll plant all we have room for,” said Uncle John, “and let Andy and Uncle David have the rest.”

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Within a few days after the tomato plants had been set out Peggy went to the garden to see how things were getting along and found the tomato



Raspberries

leaves full of tiny holes. Some of the leaves, in fact, were shriveling up. There were large numbers of tiny, black bugs on the leaves. They were active and quick, jumping and disappearing as you stooped

to look at them. Andy was working near by. He came to see them, when Peggy called to him.

"There's something just like them on the potatoes," he said. "I've seen them on potatoes before, but never noticed them on tomatoes."

Uncle John came to look.

"They're flea beetles," he said. He went into the house to look up a bulletin and find out what to do to stop them.

"You spray them with Bordeaux mixture and lead arsenate," he said, when he came back. "The same spray that you use on potatoes for the blight and for potato bugs. It's time we gave our potatoes their first spraying," he continued. "We'll do it right away, and dose these tomato plants at the same time."

They set about preparing the Bordeaux mixture. Uncle John had bought the materials long before. He had made ready a spare barrel and in this had prepared a solution of copper sulphate of such strength that a gallon of the solution equaled a pound of the sulphate. In an old wooden tub he had slaked lump lime, covering it with water after it was slaked so as to keep air away from it.

The Bordeaux mixture he now made up so as to contain eight pounds of the copper sulphate and four pounds of the lump lime in the fifty-gallon barrel of the sprayer. To this he added four pounds of lead arsenate.

“That’s a double-purpose spray,” he remarked. “The Bordeaux stops the blight and the lead arsenate stops the bugs.”

“I don’t know about stopping the blight,” said Andy. “It’s a mean disease to check.”



Getting Ready for the Cutworms

He was helping Uncle John pour the materials into the spray tank.

“It’s been a bad disease around here,” he continued. “Last year the plants died everywhere, about the middle of the summer. There wasn’t more than half a crop of potatoes. And what there were began to rot as soon as they were dug. In fact, a lot of them were already rotting when we



Spraying Potatoes

dug them. We sprayed, too, some of us. As much as two or three times. But that didn't seem to check it. We killed the bugs all right, but we didn't stop the disease."

"Where did you get your seed?" asked Uncle John.

"Mostly it was what we'd saved ourselves."

"Probably it started right there. The disease lives over in seed potatoes and spreads into the plants from them. That's why I sent away for this seed," continued Uncle John, "and paid an extra price for it. It's certified to come from a field where blight was kept out. Then we'll spray our patch pretty often. Maybe every ten days. What we've got to do is to keep the growing leaves coated with the spray all the time. Our clean seed is supposed to help us by preventing the disease from starting inside, and the spray is supposed to keep it from getting in from the outside."

"That takes a lot of time," said Andy.

"Yes, there's no doubt about that. But I want to raise a good crop if I can. It will pay, if it succeeds."

On many of the vines potato beetles, striped orange and black, were at work. They were clinging to the stems and the leaves, and had already stripped leaf stalks here and there. On some of the leaves were orange-colored batches of eggs laid by the beetles.

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"After we get this poison on the vines," remarked Andy, "the bugs will find that their food doesn't agree with them."

Presently in the garden another pest appeared. Tiny green insects began to attack the pea vines, clustering on the tender shoots and leaves.

Peggy discovered them. "They're just as thick as they can be!" she said.

Uncle John went out to look, and came back to prepare a spray for them.

"They are plant lice," he explained. "Now I wish that I had a hand sprayer. It isn't practical to use the barrel pump for a job like that. All we want to apply is just a few gallons."

He thought it over. "I'm going to borrow Uncle David's hand outfit for to-day," he decided, "and let Old Eben bring out a small rig for us tomorrow."

He went to Meadowbrook Farm and soon returned with the hand sprayer, a small pump made to be placed in a bucket. Jim filled a pail two-thirds full of water, and Uncle John measured out a small amount of brown liquid that he poured out of a can.

"That's an extract made from tobacco," he said. "It's a contact spray."

"Is it poison?" asked Jim.

"Not in the same way as the lead arsenate. This is made for sucking insects. You couldn't kill them with the spray that you use for potato bugs. Plant

lice have beaks that they push into the leaves and stems. A poison on the surface of the leaf doesn't bother them any. You have to use something that will kill them by coming into contact with their bodies. Potato bugs eat the leaves and so you can kill them with a poison that they eat along with the leaves."

CHAPTER XVI

WHEN THE SUN IS HIGH

ALL through the warm days of late spring the work at Apple-top Farm kept every one busy each waking hour. The fruit trees, the garden, the potato patch, and later the hayfields, all claimed attention. There was never lack of anything to do.

Soon after the apple trees had come into bloom the petals began to fall, and in a few days it was time for another spraying. The peach trees, also, and the plums and cherries, came in for a visit from the spray pump about this time. In the garden there was need for watchfulness, and an occasional use of the new hand sprayer.

The garden was growing rapidly. There were two or three rainy spells, with bright warm days between, and every plant seemed to start up until you could almost see it grow.

The weeds, too, grew just as fast as the other plants or sometimes faster. Uncle John had to keep fighting them with the hoe. Jim and Peggy helped by pulling weeds that started to grow in the rows among the vegetables. In some cases this was really the most important part of the work, as for instance,

in the rows of young onions where the plants were so small that the only way you could make sure that they had a chance to grow was by pulling up the weeds carefully all about them.



Young Apple Trees

“Where *do* all the weeds come from?” asked Peggy.

“From seeds, mostly,” laughed Uncle John, “just like other plants. Ground that has stood idle like

this has great quantities of weed seeds in it. As long as they are buried under several inches of soil they don't sprout. But many kinds will remain alive a long while and every time you plow or cultivate you bring a lot of them to the surface. Then they start to grow."

"I wonder if the grafted twigs on the apple trees are growing," suggested Peggy.

They walked out to the field and looked at the two trees. Most of the grafts were sending out new leaves. Only a few appeared to have died.

"We'll let them alone for a while yet," Uncle John decided. "Then we'll cut out the extra ones where both have started."

Presently the garden was ready with its first lot of vegetables to sell. There were round, red radishes and good heads of lettuce.

Friday evening after school they gathered two big baskets full of the radishes and prepared them for market, Jim and Peggy helping. The earth was washed off clean. Then the radishes were tied in bunches and packed in two layers, upside down, in shallow square boxes holding a bushel each. The red globes with white tips made a bright show.

The lettuce was cut off just below the surface of the ground and packed in similar boxes.

Early in the morning Uncle John hitched up Juniper and drove to Milford. He was back before noon. There was no difficulty in selling his produce

to the stores. In fact his vegetables were the first ones to reach Milford from the country roundabout, and commanded a good price. One of the merchants



Cherries in Crate

put a sign in his window at once, reading *Native radishes and lettuce*. The same dealer suggested to Uncle John that he drive in with another load

the early part of the next week, in addition to his Saturday trip.

When the next load went to Milford there were two boxes of young beets in the lot besides more lettuce and radishes. Again there was no trouble in disposing of the produce.

After a time there were plums and cherries to pick and market. The trees did not do very well. The lack of the first spraying had its effect on both the quality and the quantity of the crop. The early part of the season was one of unusual rainfall. It was this that helped to make the garden grow in the rather sandy soil, just as it held back the gardens in the heavier soil around Milford. Apple-top Farm gained by spring weather of that kind. But rainy weather meant favorable conditions for rot of plums and cherries, and the lack of early spraying made the matter all the worse. A part of the fruit that the trees bore was not fit to be sold.

For marketing the cherries Uncle John had bought a lot of quart baskets and some wooden crates that would hold thirty-two of the filled baskets.

Jim and Peggy helped to do the picking.

"You can help," admonished Aunt Emily, "if you'll agree not to make yourselves sick by eating too many cherries while you are picking."

"How much is too many?" demanded Jim.

"I'll tell you," replied Aunt Emily. "You do the

picking first and don't eat any while you're doing that. If you try any other plan you'll certainly lose count."



Picking Cherries

The cherries were picked into tin pails that could be hung by a wire hook from a limb. Jim fixed his pail so that it would hook into his belt. All of the

fruit could be picked from a stepladder or from the ground.

When a pail was full its contents were transferred carefully to the quart baskets, and as the baskets filled up they were fitted into the crates with a thin wooden partition between layers. They made a handsome display.

The plums were picked in the same way. But the baskets for them were oblong in shape and held four quarts each. These baskets, like the others, fitted into crates that held a bushel.

Uncle John was intending to sell the fruit at the stores in Milford. But the day that they picked the first of it he had a telephone call from some one who asked about fruit for sale and who said he'd drive out to Apple-top Farm to get it.

He came in his automobile, and proved to be the man who had stopped Uncle John and bought plants of him the first time he took flats to Milford. This time he bought for himself and his neighbor all of the fruit that was ready at that time.

Within the next two or three days other automobiles came out, driven by people who wanted to buy fruit for their own use. The word had been spread around that Apple-top Farm had fruit for sale.

The sales at the farm soon exhausted the supplies of plums and of cherries. If the fruit had been well sprayed and the crop had been larger, it might

have been necessary to take some to town. But as it was, Uncle John did not need to go to Milford.

The same people inquired as to peaches. Later they came and bought what there were. But the crop was a light one. The trees were not doing well.



Sorting Peaches

Uncle John looked the trees over many times and speculated as to their condition.

“I don’t think that the trouble is entirely due to missing the first spraying,” he said. “It just seems that the trees aren’t growing strong and thrifty. Of course they’re not young trees any more. But they are not so old that they should stop growing.”

There was no one else in the neighborhood that raised peaches, and so no one that could offer good

advice. Peach trees had been tried on two or three other farms, but the soil at the other places was not suitable or the locations were not as favorable as that of Apple-top Farm, or possibly the owners did not know how to take care of their trees.

Finally the county agent came by one noon and stopped to visit a few minutes. Aunt Emily asked him to stay to dinner, and he accepted. He wanted especially to see the apple trees that had been given the dormant spraying when they were already showing so much green, and he was surprised that they looked well.

"I was afraid it would hurt them a good deal," he said.

When he looked at the peach trees he said at once that they needed food and air.

"What I mean," he explained, "is that first of all they need cultivation. The soil ought to be kept thoroughly cultivated around them beginning in the spring and running up to the middle of summer. Then, you might sow a crop of something that will make a quick growth before winter.

"That will provide more food for them because the stirring of the soil will make the plant food that's in it more available. But in addition to that they ought to have commercial fertilizer every year. They are pretty good trees and they can be made to bear good crops."

Before he left the agent made an interesting proposal to Uncle John.

“We plan to have a demonstration day in this section,” he said, “some time this summer or fall. It would include fruit packing and probably spraying and other care of fruit trees. What would you say to having it here?”

“Do you think I could manage it?” asked Uncle John.

“You wouldn’t need to do anything except let us use your farm for the day. The extension service and the Farm Bureau will make the arrangements. Everybody that came would bring his own dinner. There would be two or three experts here from the state college.”

“You certainly can count on my place,” said Uncle John.

The showery weather of spring that had helped the garden to start so rapidly gave way in time to hot, dry days. For a while this seemed to make the plants grow all the faster. The earliest vegetables came to maturity so rapidly that the whole family was busy taking care of them—in the hours that were not occupied with other duties. There were the early peas to pick, a long task when you had to turn the vines over and look carefully to be sure that you had found every pod. There were beets to pull, wash free of dirt, and tie in bunches. There were

long, slender radishes. Presently there were early carrots.

But when the dry, hot days had continued for a week Uncle John spoke of the need for a shower.



A Standard Peach Basket

“Our land shows drouth quickly,” he remarked. “Heavy soil wouldn’t feel it, but ours does.”

“It hasn’t really been long since it rained,” suggested Aunt Emily.

"Yes, I know, but we need a good shower just the same."

In the next week there was threatening weather twice, and one evening rain came briskly for a few minutes. But it was so little in actual amount that by the next noon you would not have guessed that any had fallen.

"It didn't wet the ground an inch below the surface," Uncle John declared.

With the rake and the hoes he and Jim kept the soil in the garden well stirred on top, so as to make a blanket of loose earth that would help to keep the moisture in the ground.

The plants were beginning to show the drouth plainly. The pea vines that were due to yield the late picking lost their green color and turned quite yellow. Lettuce grew tough and sent up seed stalks. Radishes suddenly developed tall tops. Carrots and parsnips came to a standstill. Cucumber and squash vines wilted and many of their leaves turned brown and dry. Corn appeared to stop growing.

The Saturday of the second week Uncle John did not make any trip to Milford. There was nothing to take to town that he felt was fit to be sold.

"Besides," he added, "I'm sure that the gardens in that heavy, moist soil down there will not be suffering like ours. It was too wet for them in the spring, and now it will be all right."

"Can't we carry water to ours?" asked Peggy.

"We couldn't carry enough to be of any use," said Uncle John. "The well out here is low and it's a long way to the spring. Anyway, it takes such a lot of water to make any impression on a garden that only an engine and a pump, or something like



Early Cabbage

that, will do any good. Of course it's too late to think about that this year."

He and Jim went out together, down toward the spring and the slopes below it.

"I know what we'd do, another year," Uncle John declared, when they came back. "We'd put a gasoline engine at the spring to supply the house and give

us some water in the garden for emergency. And there's ground down on the slopes beyond the spring where I'd plant some of the late vegetables, things that ought to have heavier, moist soil."

All through the next four weeks the dry spell continued, with only two or three showers that were too light to be of real help.

The garden grew parched and some rows of tender things died. There were no more sales of early produce from it; nothing until the late crops.

Only the potato field, planted in heavier ground, and still diligently sprayed, looked thrifty and well. That and the apple trees.

CHAPTER XVII

NEW WAYS FOR OLD

IN a few days a letter came from the extension office at the state college asking if the Thursday of the first week in September would be convenient for the demonstration day. Uncle John sent his approval. Two weeks later the county agent called and left a sample of a small poster that he would distribute inviting farmers to come to Apple-top for the date agreed on.

"You needn't make any special arrangements," he cautioned. "If it's a good day we'll meet out there under one of the old apple trees, and if it's rainy we'll meet in the barn."

"How many will there be?" asked Aunt Emily.

"Probably twenty or twenty-five. Perhaps more if it's good weather."

"Won't you need chairs?"

"Don't bother. They'll want to stand and walk around, most of the time. If they want to sit down, there's the ground, and if we have to go to the barn, they'll have wagon seats and auto seats that they can use.

"They're supposed to come about ten o'clock," he



An Orchard in Cultivation

added, "and bring their lunches with them. We'll plan to be through by half-past three or four. I'll be here by eight and there will be two men from the college here about the same time."

In the days that intervened Uncle John and Andy, with Jim and Peggy to help, finished the season's haying. The hay that came from the big, open field they hauled to the barn and stowed away in the mow. But the grass that they cut in the young orchard beyond the spring they raked up and spread under the trees.

"From all I can learn it would seem as if the trees over there would do well under the grass-mulch plan," Uncle John said.

"What is grass mulch?" asked Peggy.

"It's a system of orchard management. The idea is to keep a layer of grass or hay under the trees, as far out as the roots extend. Underneath the layer the sod doesn't grow any more. It dies out and the roots decay after a while. The dead grass or hay on top is called a mulch and holds moisture. There are places where it works pretty well, and I have a notion that it would be a good plan in a location like that of our young orchard."

The day of the demonstration meeting proved to be both an outdoor and an indoor kind. The skies were cloudy and it threatened to rain. But no showers came in the morning and the people met under one of the old apple trees, as planned. Early

in the afternoon, however, rain began to fall, and the last hour was spent in the barn.

Because of the threatening weather the number that came was small. There were eighteen, not including the county agent and the men from the college. Most of them were already known to Uncle John and Aunt Emily, but a few were strangers. One of them, a man in a large automobile with the letters H. W. on the side, nobody had seen before. He gave his name as Henry Warner, but offered no further information about himself.

When they had gathered under the apple tree the county agent introduced the first speaker. He took as his subject orchard management, and he began talking at once about the very tree that they were sitting under.

Jim and Peggy were sitting back of the rest.

"He's talking about our own trees!" Peggy exclaimed.

"There are hundreds of trees just like this skyscraper all over this county," the speaker began. "Most of you have some of them on your farms. They've been good trees in their time. And many of them can be good producers still."

He went on to say, then, that first of all a lot of these trees needed to be pruned and brought down to a better shape and height.

"That's what daddy said," whispered Peggy.

Some one in the audience pointed out one of the trees that Uncle John had trimmed.

“Yes, that’s a good start,” said the speaker.

The second thing that many of them needed, he went on, was to have a square meal. They were not being fed enough. They stood in grass and every



Bees Are Necessary in Orchards

year the farmer kept cutting the hay beneath them and hauling it away. Under the heavy sod the soil didn’t get enough air for plant food to form rapidly, and a good deal of that which was formed the grass roots secured.

Often what such trees needed was an allowance of commercial fertilizer, instead of permitting the grass to absorb most of the available food.

"Take this apple here," he said. "The grass has been cut and hauled away. It ought really to have been left beneath the tree. Other grass from round about, or maybe old hay or straw, or even weeds, should be spread under the tree until there was a covering two or three inches thick. Besides that it might be advisable to apply fertilizer."

Another plan, he said, would be to plow and harrow beneath the tree. That would probably give it a setback for a year or two because of breaking many feeding roots. But it would recover. Cultivation after that would help to feed the tree because plant food that was in the soil would be made over into forms that the tree could use. Trees required food, just like people or any other living things.

The rows down there, all along the stone wall, he said, were in rich ground. They hadn't exhausted the plant food and so they were bearing a good crop.

He went on, then, to talk about spraying, and explained what each spray was intended to accomplish. The first in importance, he said, was the dormant spray.

"Our trees pretty nearly missed that one!" whispered Peggy.

The next in value was the one that you apply just as the petals are falling, because it controls the com-



One Type of Box Pack

mon apple worm, the one that tunnels around the core.

After that he talked of other sprays and their purpose. Then he spoke of pruning. The question of packing and marketing fruit, he said, would be left until after dinner. Another man would discuss that and would give a demonstration.

When he had finished there was a lively discussion. Various people asked him questions and told their experiences.

“What about care of young trees?” some one asked.

“You might come across the run and demonstrate with mine,” Uncle John laughed.

So they all walked over to the young orchard. The speaker said that the grass-mulch plan would probably be all right there. But many orchardists would prefer to follow the cover-crop plan.

“What does he mean by cover-crop plan?” said Jim to Peggy.

Some one else asked the same question loudly enough for the speaker to hear, and he explained: The scheme was to keep the ground cultivated between the trees, beginning the first thing in the spring and continuing until the middle of summer. Then you stopped cultivation and sowed some kind of a crop, such as crimson clover or rye, and let that grow for the rest of the summer. That was the

cover crop. You plowed it under the next spring. And so on each season.

"Is that a good plan for peaches?" asked Uncle John.

"Yes," said the speaker, "but you ought to use fertilizer on them, too."

"I guess that's what mine need, then," commented Uncle John. "They aren't bearing well."

They went to look at the peach trees. On the way they passed a corner of the orchard behind the barn. The trees there were loaded with apples. Aunt Emily's pullets were ranging everywhere in the orchard. The speaker called attention to the chickens.

"That's a good combination," he remarked. "The chickens benefit the trees and the trees furnish shade for the chickens. It pays to keep some chickens."

"How about keeping bees?" some one asked.

"Bees are necessary in every orchard at blooming time," he replied. "They carry pollen from one blossom to another and make the fruit start forming. If there aren't enough bees in a neighborhood the orchardist ought to keep a few hives himself. Many growers do so."

"Will they fly far?"

"Yes, they'll range a long way. But you are more certain of having your own blossoms taken care of if you have your own bees right in the orchard."

"They'll pay their own way," some one remarked.

"With good care they'll do more than that."

They'll furnish you with all the honey you can use on your own table, and some to sell besides. You can make a profit on them at the same time that they are benefiting the fruit crop."

The most interesting part of the day to Jim and Peggy was the demonstration of fruit packing



Wrapping an Apple

That took place in the barn, after the rain had driven them in.

The county agent had brought a clean, empty barrel, a barrel press, an empty bushel box, various baskets and crates, and a supply of early apples to work with.

An expert from the college packed the barrel. He started with a smoothly placed layer at the bottom. On this he poured other fruit, a basketful at a time,

lowering the basket into the barrel and turning it over carefully so as not to let the fruit drop from a distance.

"That's the way we did at Uncle David's last year," said Jim to Peggy.

Then he fitted a layer of selected apples in the top of the barrel so that they projected a little above the rim. When the lid was laid on top it seemed as if it could not be gotten into place, but a big press squeezed it down.

"Now the apples won't get loose and rattle around in the barrel," said the expert.

In packing a box with apples he first showed them the various ways that the fruit could be arranged, according to its size, or depending on the ideas of the grower.

"Different men prefer different packs," he said.

Then he taught them how to wrap an apple, placing a square of paper in the palm of one hand, dropping an apple into the middle of it with the other, closing the fingers so as to bring the paper up around the apple, and finally giving it a twist that brought the wrapper neatly around it: slowly, at first, so that they could see each move, and then so rapidly that it all seemed to be done in a moment.

"That's the way daddy says we're going to do some of our apples," said Peggy to Jim.

"Bet you couldn't wrap 'em like that!"

"I'll bet I could!"

The expert showed them small boxes made of cardboard.

"Some men have tried these," he said. "The idea



Fruit Is Picked While Still Firm

is to use a smaller pack so that the apples can be carried home in it from the store. The regular box is too big for that, of course, unless the customer comes in his automobile. One large fruit grower has tried small baskets. But for most trade the best fancy pack that we have to-day is the regular bushel box."

He spoke about labels.

"Give your farm a name," he said. "Something that is different and is easily remembered. The name of the place here is all right: *Apple-top Farm*. There are lots of others.

"Then have a label made and use it on all your fruit packages. Use it on your letterheads, too, and put up a neat sign beside the road with your label on it. A good name and a good reputation are worth something in any business."

At three-thirty the meeting came to an end and everybody started for home.

"Daddy," said Peggy that evening, "why did the man say to plant something like rye in an orchard and then to plow it up the next spring and then to plant it again?"

"You plow it in the spring," suggested Uncle John, "because you want to cultivate the soil during the early part of the growing season. The plants that you plow under make the soil richer. Then you seed it again in July or August because that helps to make the trees get ready for winter. It keeps the soil from washing during the fall and winter and it keeps it from freezing so deep. Besides, you want a new crop to plow under in the spring, to keep enriching the soil."

"Are you going to do that with our peach trees?"

Uncle John was silent for a minute or two.

"If we stay here I will," he said finally.

CHAPTER XVIII

THE END OF THE YEAR

JUST as long as the barrel sprayer could be driven through the potato field Uncle John kept applying the spray every ten days to two weeks.

The plants grew splendidly and the treatment was a success. There could be no doubt about that. The blight was kept out and the bugs had no chance to do any damage.

The experiences of other farmers in the neighborhood were not alike. There were a few who sprayed only two or three times and yet happened by some chance not to have blight.

"It will turn out that way sometimes," declared Uncle John. "They were just lucky. That was all. Another time they wouldn't be so fortunate."

Most fields, however, began to fail early in August and by the end of the month the plants looked almost dead.

One of these fields, unfortunately, was Andy's.

"I sprayed mine, right along," he complained. "But the disease seemed to get started just the same."

"Probably it was that seed that you used," sug-

gested Uncle John. "They say the only safe way is to start with certified seed."

Even after the weather had grown cool and autumn was fast approaching the potato field at Apple-top Farm remained green. Finally, with the coming of frosts, the plants turned brown as they



The Potatoes Were Saved from Blight

should when cold weather approaches. Within a week all were dead.

Some time later Andy came to help Uncle John, and they dug the piece. Jim and Peggy had gone to school, but came back in time to help pick up potatoes and fill the bags.

Uncle John decided to store them for the present in the basement of the old barn across the road. He

brought boards and made a rough partition, so that there was a sort of bin to hold them. The earth floor of the barn cellar made the bottom of the bin.

On a post near by Uncle John tacked a clean piece of board. He fastened a pencil to it by a string. As they brought in a load of potatoes in the wagon and emptied the sacks they made a mark for each sackful.

The crop was a good one. It was the best record that Apple-top Farm had made since the early broilers that brought the big price. It helped to balance the drouth in the garden and the poor crop of peaches. The potatoes were smooth and showed no sign of disease. The yield was heavy, almost at the rate of three hundred bushels to the acre.

"All that I wish," Uncle John said to Aunt Emily when the crop was all in the bin, "is that we had more acres to harvest. If we had ten acres of a crop like that we'd be in good shape."

Before school began Uncle John and Jim made some further changes in the henhouses. The brooder stove they had taken out long before and stored in the loft of the tool house. Now they made additional openings in the front of the larger part, where the old hens had been, and took down the temporary partitions. Once more they gave the inside a good cleaning and a spraying with disinfectant.

Aunt Emily's pullets had grown to be almost as

large as full-grown hens. They were beginning to lay. There were about two hundred of them, but no one could be positive just how many there were, for each time any one tried to count the number came out a little different.

"It doesn't make any difference," Aunt Emily declared. "They are a good flock and they're going to produce lots of eggs pretty soon."

Toward the end of summer the flowers that Aunt Emily had raised found some sale. A few of the people who came to buy fruit bought flowers also. The sales were not large. With the money received from the six flats sold at the beginning of the season the total sum more than equaled the cost of seed. But it was not a total that made a considerable source of income.

The flowers, like the vegetables, had suffered badly from the drouth. Aunt Emily was confident that more sales could have been developed, if the flowers could have had a supply of water.

"Besides, it would take time to let people know about them," she added.

The berries from the rows of bushes that Uncle John and the children had pruned were hurt somewhat by the dry weather. Nevertheless, Jim and Peggy, with help from Aunt Emily, picked a good many quarts. There were several crates sold, and the return was a substantial sum to add to the credit of the farm. The wild berries in the pasture,



Digging Potatoes

and the blueberries near the rocks below the spring, yielded enough for the table and for canning, but not enough to sell.



Canning the Surplus

As the summer passed Aunt Emily and Peggy did a good deal of canning.

“We’re going to have a supply of our own fruits and vegetables for next winter, whether we sell fresh things or not,” Aunt Emily declared.

Steadily the rows of jars and glasses on the shelves in the big pantry increased. Finally, one day, Aunt Emily counted them.

"How many jars do you suppose we have?" she asked Uncle John.

"Give it up," he laughed. "More than a hundred, probably."

"That isn't a good guess," replied Aunt Emily. "There are four hundred and thirty-two, big and little."

"What are you going to do with all of them?" Uncle John demanded.

"There won't be a bit more than we'll use," Aunt Emily replied.

One day in the fall the man who had bought the apple crop the year before drove into the yard. He walked about over the farm with Uncle John and talked with him on the piazza afterwards. But Uncle John shook his head.

"I can't tell you to-day," he said. "We'll talk it all over to-night and I'll let you know in the morning."

After he had gone Uncle John got out a little memorandum book that he had kept in his pocket all season. There were columns of figures in it. These Uncle John studied for a long time.

He was still looking them over when an automobile drove into the yard and a man got out of it and came up to Uncle John, holding out his hand.

“My name is Henry Warner,” he said. “I was here the day of the demonstration.”

He sat down and talked for a few minutes. Then the two walked about over the farm. When he left Uncle John made the same statement to him that he had made to the apple buyer. “I can’t tell you to-day,” he said. “I’ll let you know in the morning.”

Before supper Aunt Emily and Uncle John talked earnestly. In fact they talked so long that supper was late. When it was finished and they had all gone into the big living room Uncle John took the memorandum book out of his pocket and sat thumbing the pages.

“I’ve been figuring up how we stand with Apple-top Farm,” he said. “I think we’ll have to decide about keeping it. We’ve had a year now. So we can tell pretty well how we are coming out.”

“Aren’t we going to stay?” demanded Peggy.

“That’s what we must figure out,” replied Uncle John.

“I’ve kept account of everything in this memorandum book,” he continued. “All that we’ve spent and all that we’ve received. You remember we made out a list last winter of the tools and supplies we’d need. Well, leaving those things out the money that we’ve paid out almost exactly balances the money we’ve taken in.”

“Yes, I know, but we have——,” began Peggy.

Uncle John laughed.

"Of course we have!" he said. "That's the other side of the story. Our potatoes haven't been sold yet, and they will equal the cost of the supplies that we've bought. Maybe they'll do more than that, if we sell them at a good price."



Apple Storage as Uncle John Planned It

"We have a lot of maple sirup to sell," remarked Jim.

"That's true. I almost forgot that. This winter we must pay the interest charge on our investment," continued Uncle John. "Our apple crop will meet that and a little over. The buyer was here to-day and made an offer."

"But you said we'd pick this year's crop our-

selves," objected Jim, "and put some of it into fancy boxes."

"We will do that, if we stay. I think we could realize more than the buyer offered."

"How about our pullets?" asked Peggy. "They're just beginning to lay. And all the canned things we've put up. They are worth something."

"Yes," said Uncle John, "I do think we've made a fair return."

He was silent for a moment.

"There was another man here to-day," he resumed. "The man who came to the demonstration in the big automobile, Mr. Warner. He wants to buy Apple-top Farm."

"But it's promised to us!" Jim exclaimed.

"Yes. But he'll buy it from us. He's willing to pay us a thousand dollars more than we have to give for it."

Jim and Peggy were silent.

Finally Peggy spoke.

"Do you think we ought to sell it to him?" she asked.

"Suppose I ask you two youngsters a question," proposed Uncle John. "Do you *want* to go back to the city to live?"

"No!" they both answered.

"All right," said Uncle John. "We'll stay."

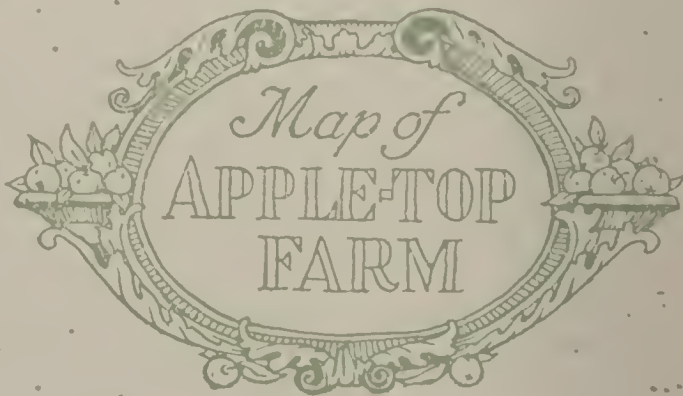
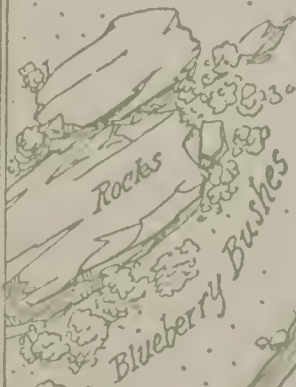


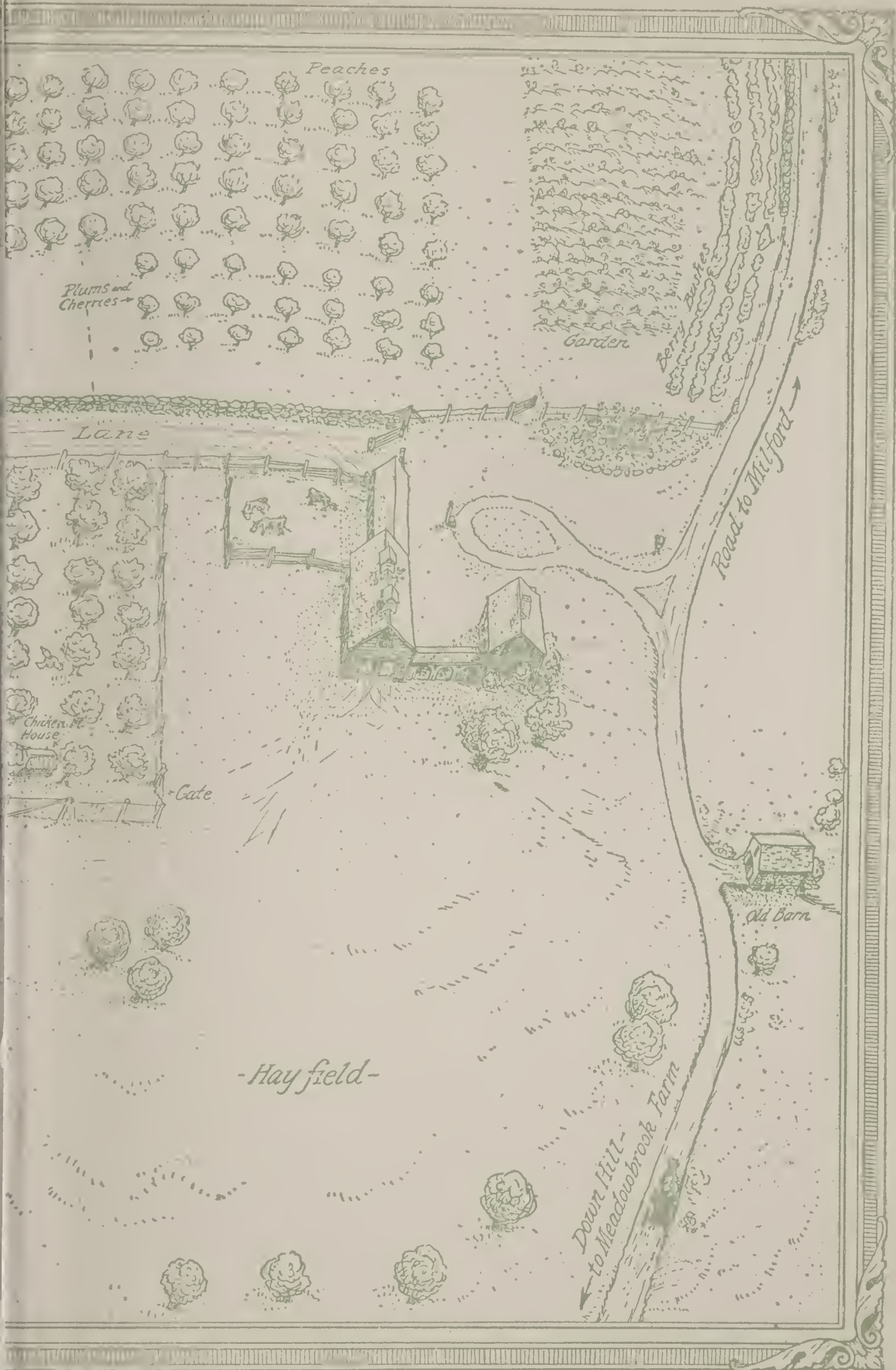
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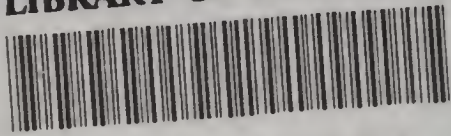
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